

An Evaluation of the Human Domain Concept: Organizing the Knowledge, Influence, and Activity in Population- Centric Warfare

A Monograph

by

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Abstract

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As the US military prepares for future conflicts, the increasing likelihood of population-centric approaches to warfare sparks the need for adaptation to better understand, influence, and act in the human environment. The idea of a human domain of warfare emerged from the need for adaptation. Warfighting domains provide the US military with a division of labor and knowledge for creating, developing, and employing warfighting capabilities. Proponents for including a human domain argue that viewing populations as a military operating realm will better integrate joint operations, focus the US military's future innovation, and delineate primary tasks between special operations and conventional forces. Organization theory and management research demonstrates the ability for new domains to generate innovation. However, innovation and expansion in dynamic environments tend to avoid interdependencies. The development of the US Navy from 1865 to 1898, the US Air Force from 1911 to 1947, and the current development within the space and cyber domains provide additional insights into the dynamics of warfighting domains and military innovation. The development in sea, air, space, and cyber domains demonstrate four key relationships between innovation and integration: uneven risk to forces, unequal rates of adaptation between interdependent forces, conflicting requirements for investment, and building civilian sector capacity to support. Ultimately, the human domain concept provides an analogy to guide strategic thinking, but not an organizational construct for pursuing the goals of integration, adaptation, and delineation of tasks.

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Acronyms

ARCIC	Army Capabilities Integration Center
ARPANET	Advanced Research Project Agency Network
ARSOF	Army Special Operations Forces
CBO	Combined Bomber Offensive
COIN	counterinsurgency
CP	counter-proliferation
CT	counterterrorism
DOTMLPF-P	doctrine, organization, training, materiel, leader development, personnel, facilities, and policy
FID	foreign internal defense
GHQ	General Headquarters
HAMO	Human Aspects of Military Operations
ICBM	intercontinental ballistic missile
JFC	Joint Force Commander
JIIM	joint, interagency, intergovernmental, and multinational
JOPP	Joint Operations Planning Process
JTF	Joint Task Force
NATO	North Atlantic Treaty Organization
SFA	security force assistance
SOF	Special Operations Forces
USASOC	United States Army Special Operations Command
USSOCOM	United States Special Operations Command
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command
UW	unconventional warfare

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Introduction

Watch your thoughts, they become words; watch your words, they become actions; watch your actions, they become habits; watch your habits, they become character; watch your character, for it becomes your destiny.

–Frank Outlaw “What They’re Saying”

As the US military reflects on its experiences in Iraq and Afghanistan, the idea that warfare changed its character influences the need to adapt the military organization for future conflict. A future environment with the potential for increased instability in under-governed areas, competition over dwindling resources, rapidly expanding populations, and competing ideologies in an increasingly interconnected world implies the character of warfare will continue to resemble the present conflicts.¹ The US military designates this form of warfare as irregular, with increased interaction between warfighters, adversaries, and local inhabitants, requiring indirect and population-centric approaches to operations.² Population-centric approaches to warfare in recent conflicts caused new habits, actions, words, and thoughts within the US military, in particular, its soldiers, marines, and special operations forces (SOF) fighting on the land.

In May 2013, the US Army, Marine Corps, and Special Operations Command’s senior leaders released “Strategic Landpower: Winning the Clash of Wills,” on the future role of landpower in US policy and military strategy. This whitepaper described military interventions, such as Vietnam, the Balkans, Somalia, Iraq, and Afghanistan as exceptions to traditional

¹ Select Committee on Intelligence, *Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community to the Senate Select Committee on Intelligence*, by James R. Clapper, 113th Cong., 1st sess., S. Hrg. 113-89 (Washington DC, March 12, 2013), 1-13, accessed March 10, 2015, <http://www.intelligence.senate.gov/130312/clapper.pdf>.

² Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington DC: Government Printing Office, amended January 31, 2011), 189.

warfare. In these conflicts, the US military prepared to dominate the physical environment with force. However, the overwhelming military might employed from the land, sea, air, space, and cyber networks against these non-traditional enemies resulted in failure to achieve strategic objectives. The US military's landpower leadership identified this gap in effectiveness as the human domain, which consists of the physical, cultural, and social environmental mental factors influenced by the land and cyber domains, and containing objectives to defeat an opponent's will to resist.³ The respective leaders of US military's landpower components called for action to invest in and improve the US military's ability to fight and win in irregular warfare.

The whitepaper concluded by asking if a human domain concept compares to the current warfighting domains: land, sea, air, space, and cyber. Previously, expanding into these warfighting domains provided a method for the US military to prioritize and focus its institutional efforts in developing the capacity to project military power. Expanding the capability to operate in a human domain could likewise increase the US military's ability to achieve influence over populations in combat. Is there utility in adopting a human domain among other warfighting domains?

This monograph suggests there is utility in pursuing a human warfighting domain, but not without the risk of unintended consequences. In order to adopt the human domain, the concept must conform to other warfighting domains in definition and purpose. Additionally, the concept needs to achieve its goals of improving the US military's capability and capacity to excel in military operations with a population-centric focus. Finally, this concept requires addressing the theoretical and historical organizational tensions, which emerged in other warfighting domains. The conceptual purpose, utility, and history surrounding warfighting domains improve the

³ Raymond T. Odierno, James F. Amos, and William H. McRaven, "Strategic Landpower: Winning the Clash of Wills" (Washington DC, May 2013), 2, accessed June 21, 2014, <http://www.tradoc.army.mil/FrontPageContent/Docs/Strategic%20Landpower%20White%20Paper.pdf>

understanding of the human domain and its initiatives. Ultimately, this understanding helps to inform better decisions on future institutional adaptations in the US military's approach to population-centric warfare.

In order to evaluate the utility of a human domain concept, the next section reviews the available literature to define warfighting domains, establish their functional purpose, and expands upon the human domain concept's intended purpose and initiatives. The definition of domains and their purpose provides the essence for the human domain's goals. These goals define the human domains utility if included among the warfighting domains. The second section introduces organization theories and associated business research to evaluate the human domain concept's utility as a method to developing capabilities for population-centric warfare approaches.

Organization theory and management practices highlight potential effects from adopting the human domain concept to inform future military development. Knowledge imparted from these theories and practices helps to anticipate unintended consequences. The final section of this paper uses historical examples from the sea, air, and the two technology focused domains – space and cyber – to illustrate dilemmas and conflicts, which can influence the human domain's conceptual efficacy. By using the historical context from other warfighting domains, the potential effects described in the theory provide insights into the conditions that could create or amplify unintended consequences.

Literature Review: Shaping the Human Domain Concept as a Warfighting Domain

The definition of the word domain, its development as a military concept, and its doctrinal application influence the human domain's utility as a warfighting domain. This section establishes the definition and utility regarding military domains and their role in military operations and planning according to US Joint Doctrine and various theorists. The definition and

application of warfighting domains will then provide a framework for understanding the supporting initiatives, their benefits, and opinions regarding the human domain concept.

Warfighting Domains: Connecting Physical Activity to Knowledge and Power

Military doctrine does not define common characteristics of all domains, only the description of each individual domain. Therefore, further understanding domains requires three areas of focus. The first area is the definition of the word domain and the use of domain and other equivalent words in military literature. The second area is two theories covering the utility of domains in military operations and institutionalization. The third area is the application of domain concepts in military doctrine. Ultimately, the concept of domains connects the physical environment with the knowledge to act and influence within a specific environment.

The English definitions from the *Merriam Webster Dictionary* “the land that a ruler or a government controls” and “a sphere of knowledge, influence, or activity” defines domain for the purposes of this monograph.⁴ These two meanings, a controlled realm and the associated military institutional knowledge, ability to influence, and operating activity within that realm represents the US military’s application of warfighting domains.

Domain is a relatively new term in military doctrine.⁵ In literature, dimension, medium, and occasionally domain provided interchangeable substitutes to describe the different physical environments, while other words described knowledge, influence, and activity. For example, after aviation, the term dimension became the predominantly accepted way to delineate the spatial

⁴ *Merriam Webster Online*, accessed July 21, 2014, <http://www.merriam-webster.com/dictionary/domain>.

⁵ For some early examples using “domain” see: William A. Robson, *Aircraft in War and Peace* (London: MacMillan, 1916), 9; Ted Schroeder, “The Misunderstood Basics” *Military Review*, LIX, no. 1 (January 1979): 16, accessed December 1, 2014, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p124201coll1/id/357>.

realm, whereas the term air-mindedness represented the cognitive relationship between theory, action, and the physical environment.⁶ Airpower described projecting influence through the physical realm and air warfare described the activity. As space became distinctly separate from the vertical dimension, the term medium became the preferred method to designate the separate physical areas to project power and influence.⁷

“Joint Vision 2020,” released in June 2000, introduced Full Spectrum Dominance – a joint operating concept in which control in each domain ensures access and freedom of maneuver and creates conditions for strategic success.⁸ The document concluded with an approach to synchronize the component concepts for Full Spectrum Dominance with the unique capabilities and developments in each military service. “Joint Vision 2020” also highlighted the need for intellectual innovation in addition to the technological development and improvements in human resources procedures – recruiting, training, and educating.⁹ Following the release of “Joint Vision 2020,” domain became the common word used to define operating areas previously called dimensions or mediums.

⁶ As an example, see William Mitchell’s Testimony to the President’s Aircraft Board. Dwight W. Morrow, et al., *Aircraft: Hearings before the President’s Aircraft Board*, vol. 2 (Washington DC: Government Printing Office, 1925), 547, accessed March 15, 2015, <http://hdl.handle.net/2027/mdp.39015007665410>; Dale L. Hayden, “Air-Mindedness,” *Air & Space Power Journal* 22, no. 4 (Winter 2008): 44, accessed March 12, 2015, <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj08/win08/hayden.html>

⁷ As examples see: Paul B. Stares, *The Militarization of Space: US Policy 1945-1984* (Ithaca, NY: Cornell University Press, 1985), 28; United States Space Command, “Long Range Plan: Implementing USSPACECOM Vision for 2020” (Peterson AFB, CO: US Space Command, March 1998), 7, accessed December 1, 2014, <http://babel.hathitrust.org>; Dennis Drew “The Essence of Aerospace Power,” *Aerospace Power Journal* 15, no. 2 (Summer 2001): 29, accessed November 27, 2014, <http://search.proquest.com/docview/217762561>.

⁸ Cyber was not considered a warfighting domain until 2010. However, cyber was mentioned in this document as part of the information domain. Joint Chiefs of Staff, “Joint Vision 2020” (Washington DC: Government Printing Office, June 2000), 6 accessed November 10, 2015, <http://www.dtic.mil/docs/citations/ADA377926>.

⁹ Ibid., 35-6.

American theorist Everett Carl Dolman, a Professor at the US Air Force's School for Advanced Air and Space Studies, developed a theory of operational strategy to describe the unique operating concepts within the land, sea, and air operating realms. The separate components of military power – landpower, seapower, and airpower – project influence through tactical actions in their respective mediums to dominate or contest the physical control of each operating realm relative to an adversary and within the constraints. Freedom of maneuver in each medium provides a unique, qualitative advantage to influence adversarial decision-makers. While bureaucratic efficiency and differences in equipment to perform primary missions also demarcate differences in each domain, the utility to control and project a politically appropriate level of violence in each domain give the components of military power their uniqueness. Each military service – the US Army, Navy, and Air Force – builds the unique physical and cognitive capabilities to dominate their respective domains, to include cross-domain overlaps, which deter, deny, and exploit those operating realms against an adversary.¹⁰

Johns Hopkins University researchers, Dr. Patrick Allen and Dennis Gilbert, share a view similar to Dolman in their definition of domains. To argue for including cyber among the operational realms, Allen and Gilbert define warfighting domains as “the sphere of interest and influence in which activities, functions, and operations are undertaken to accomplish missions and exercise control over an opponent in order to achieve desired effects.”¹¹ Like Dolman, they see the threat, cross-domain effects, unique attributes, and control as important to warfighting domains. While Dolman advocates that bureaucratic efficiency and structure are side effects of warfare's expanding scale, Allen and Patrick view them as a necessity for creating the funding

¹⁰ Everett Carl Dolman, *Pure Strategy: Power and Principle in the Space and Information Age* (New York: Routledge, 2005), 30-36.

¹¹ Patrick D. Allen and Dennis P. Gilbert, "Information Sphere Domain: Increasing Understanding and Cooperation," in *Virtual Battlefield: Perspectives on Cyber Warfare*, ed. Christian Czosseck and Kenneth Geers (Amsterdam: IOS Press, 2009), 137-8.

and investment in institutions to develop and preserve the habitual ability to understand and operate in the environment.

Translating knowledge into action is important to operational planning in the military; warfighting domains support the planning process. In 2012, the Joint operating concept Cross-Domain Synergy replaced Full Spectrum Dominance. Cross-Domain Synergy calls for “the complementary, vice merely additive, employment of capabilities in different domains, such that each enhances the effectiveness and compensates for the vulnerabilities of the others.”¹² Within the Joint Operations Planning Process (JOPP), domains are categories for interpreting the physical environment. Comparisons between friendly, neutral, and enemy capabilities in each domain dictate considerations and constraints for planning.¹³ Domains also constitute potential lines of operations in a joint operations plan.¹⁴ The efforts or decisive points along the lines of operations combine to achieve desired effects, objectives, or end states. Finally, the Joint Task Force Commander (JFC) may designate functional command structures based on domains.¹⁵ For example, a Joint Force Air Component Commander receives missions, responsibilities, authorities, or tasks from the Joint Task Force (JTF), and controls all aircraft or missiles transiting a defined operating area. Through JOPP, warfighting domains provide the JFC and the JTF staff one method to understand, visualize, describe, and direct operating environments and approaches, which correspond to the available components of power.

As concepts, warfighting domains conform to both definitions of the word domain; they

¹² Joint Chiefs of Staff, “Joint Operational Access Concept” (Washington DC: Government Printing Office, 2012), ii.

¹³ Joint Publication (JP) 5-0, *Joint Operations Planning Process* (Washington DC: Government Printing Office, 2011), III-8.

¹⁴ *Ibid.*, IV-48.

¹⁵ Joint Publication (JP) 3-33, *Joint Task Force Headquarters*, (Washington DC: Government Printing Office, 2012), I-4.

connect the physical realm, the power to influence, the theories of action, and the institutional knowledge to build the capability and capacity for warfare. By focusing the efforts for action and influence, warfighting domains support the employment military power toward strategic and political aims. Institutional development and investment to support the ability to understand and operate in warfighting domains is necessary to build the proper operating concepts, supported by people, technology, and processes. Because warfighting domains delineate capability development, they also become a method to support operational planning and structure. The human domain concept must also conform to the definition and purpose demonstrated in other warfighting domains.

The Human Domain is a Warfighting Domain in Essence

The background, influences, and impetus for defining an additional warfighting domain in the human environment is important to the development of the human domain. Recent experiences, strategic guidance, and intra-organizational tension shape a novel approach to define a new domain of warfare. The human domain, as intentionally defined, displays the essences of the other warfighting domains.

The idea for a human domain emerged from several influences. In 2005, General Sir Rupert Smith, a forty-year British Army veteran and former North Atlantic Treaty Organization (NATO) commander in the 1995 Bosnian conflict, published his book, *The Utility of Force*, in which he argues that future wars will be “wars amongst the people,” rather than the conventional application of military force characterized by World War II and the Persian Gulf War in 1991.¹⁶ A 2009 Congressional Research Report highlighted the chasm splitting the US Army between creating a force structure to contend population-centric warfare and conventional warfare; the two

¹⁶ Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (New York: Vintage Books, 2008), xiii.

approaches to address the dilemma were creating separate forces for stability and counterinsurgency operations or building the capability to conduct population-centric warfare through increased doctrine, education, and training. The US Army preferred an approach for a full-spectrum force structure.¹⁷ The United States' 2010 National Security Strategy directed the Department of Defense to "continue to rebalance our military capabilities to excel at counterterrorism, counterinsurgency, stability operations, and meeting increasingly sophisticated security threats, while ensuring our force is ready to address the full range of military operations."¹⁸ The human domain concept derived from the tensions between conventional and population-centric warfare.

The broadest definition used by proponents for adopting the human domain comes from US Army Generals Bennet Sacolick and Wayne Grigsby. They identify the human domain as, "the totality of the physical, cultural, and social environments that influence human behavior to the extent that success of any military strategy, operation, or tactical action depends on the application of unique capabilities that are designed to fight and win population-centric conflicts."¹⁹ This definition identifies the linkages between the environmental realms, influence, action, and knowledge to build capability represented by warfighting domains. The manner in which the proponents for inclusion of the human domain define the concept gives it the essence

¹⁷ Andrew Feickert, "Does the Army Need a Full-Spectrum Force or Specialized Units? Background and Issues for Congress" (report, Congressional Research, January 18, 2008), 2-12 accessed March 12, 2015, <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA476145>; See also Frank L. Andrews, "A Stability Force: The Missing Link in Achieving Full-Spectrum Dominance" (monograph, US Army Command and General Staff College, 2004), ii, accessed February 24, 2015, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll3/id/88>.

¹⁸ Barack Obama, *National Security Strategy* (Washington DC: Government Printing Office, May 2010), 14, accessed July 12, 2014, <http://nssarchive.us/NSSR/2010.pdf>.

¹⁹ Bennet S. Sacolick and Wayne W. Grigsby, Jr. "Special Operations/Conventional Forces Interdependence: A Critical Role in 'Prevent, Shape, Win'," *Army* 62, no. 6 (June 2012): 39, accessed December 3, 2014, <http://search.proquest.com/docview/1022319740>.

of a warfighting domain.

Having the essence of a warfighting domain does not make the human domain useful. As Dr. Martin Libicki, a researcher for the RAND Corporation, explored organizational adaptations required for developing capability in the cyber domain, he commented: “Whether cyberspace does or does not have the essence of a warfighting domain ...is not at issue... [U]nderstanding cyberspace as a warfighting domain is not helpful when it comes to understanding what can and should be done to defend and attack networked systems. To the extent that such a characterization leads strategists and operators to presumptions or conclusions that are not derived from observation and experience, this characterization may well mislead.”²⁰ Warfighting domains, as concepts, derive value from their utility to shape knowledge, action, and influence in a physical environment.

Integrating, Adapting, and Focusing Through the Human Domain

There are three broad categories of opinion regarding the associated benefits, opportunities, or risks regarding adopting the human domain amongst other warfighting domains. The first view argues that the concept of a human domain provides a better integrative method between joint operating concepts and military strategies. The second perspective uses the human domain as a revision of the land domain, which advocates more focus on manning, training and equipping for population-centric warfare and the human environment. The third category makes a similar argument as the second, but also includes the delineation of roles and interdependencies of special operations and conventional forces. Altogether, these three approaches generated several initiatives adopted by the Joint Staff and the US Army. In total, these initiatives address the knowledge, influence, and activity required to understand and operate in the human

²⁰ Martin C. Libicki, “Cyberspace Is Not a Warfighting Domain,” *I/S: A Journal of Law and Policy* 82, no. 2 (2012): 322, accessed November 23, 2014, <http://moritzlaw.osu.edu/students/groups/is/files/2012/02/4.Libicki.pdf>.

environment.

The human domain as an integrating component for other warfighting domains provides one option for its utility as a warfighting domain. The United Kingdom's Ministry of Defence uses a "human domain framework" for analysis of the operating environment, which allows for a comprehensive joint and interagency understanding of the human environment.²¹ Traditionally, new technologies such as aircraft, satellites, and computers drove organization in new warfighting domains. US Marine Corps General James Mattis, as the commander of Joint Forces Command responsible for planning and integrating future force development, testified in the House Armed Service Committee "war remains fundamentally a human endeavor that will require human solutions."²² While technology was a driving factor for military development, human factors such as society, politics, and economics have also shaped military innovation.²³ Organizing for increased understanding of human environments, in the manner the US military pursued technological solutions to warfare in other domain, has the potential to create an integrated, joint domain.²⁴ However, it is questionable whether adding another domain would improve the ability to integrate military efforts, because the current, archaic domain-centric theories produce

²¹ United Kingdom, Ministry of Defence, Joint Doctrine Publication 4: *Understanding* (Shrivenham, UK: Development, Concepts, and Doctrine Centre, December 2010), 3–5.

²² James Mattis, "House Armed Service Committee Testimony, 18 March 2009" *Small Wars Journal*, March 24, 2014, accessed November 22, 2014, <http://smallwarsjournal.com/blog/general-james-mattis-before-the-hasc-18-march-2009>.

²³ Andrew Krepinevich, "Cavalry to Computer: The Pattern of Military Revolutions." *The National Interest* 37 (Fall 1994): 30; Williamson Murray and MacGregor Knox "Thinking About Revolutions in Warfare," in *The Dynamics of Military Revolution, 1300-2050*, ed. Williamson Murray and MacGregor Knox (New York: Cambridge University Press, 2001), 6-7.

²⁴ Frank Hoffman and Michael C. Davies, "Joint Force 2020 and the Human Domain: Time for a New Conceptual Framework?" *Small Wars Journal*, 10 June, 2013, 2, accessed November 22, 2014, <http://www.smallwarsjournal.com/printpdf/14125>

disparate operating concepts.²⁵

The US Joint Staff, J-7 Joint Force Development recently began to incorporate these ideas of the human domain into a component of the future publication, the “Joint Concept for Integrated Campaigning,” under the name Human Aspects of Military Operations (HAMO). HAMO incorporates increased analysis of the human environment and the ability to operate in such an environment into the Joint Capabilities Integration and Development System.²⁶ This perspective provides solutions to adapting education, training, and technology to understand an environment, but offers no new concepts for how increased knowledge can translate into action.

A second potential use for the human domain advocates revision of the land domain into a human domain. This argument seeks increased knowledge, similar to the first view of the human domain. However, this second perspective also provides processes focused on a doctrine of population-centric warfare and defines the purpose for actions in the human domain to influence human behavior. The increased likelihood of population-centric conflict means the US military, in particular its landpower components, needs to prioritize institutional adaptation around population-centric warfare.²⁷ Advocates of this argument see the priority in investing more time and resources in people and concepts and less on technology.²⁸ New ways to use the

²⁵ Bob Simpson, “Unified Field Theory: The End of Domain Centered Theories of Warfare,” *On Theory*, December 18, 2014, accessed January 5, 2015, <https://medium.com/on-theory/the-end-of-domain-centered-theories-of-warfare-d3ec7347bf28>.

²⁶ Strategic Landpower Task Force, “Future Joint Concepts Focus on Human Elements,” *WWW.ARMY.MIL: The Official Homepage of the United States Army*, January 22, 2015, accessed January 25, 2015, http://www.army.mil/article/141535/Future_joint_concepts_focus_on_human_elements.

²⁷ Charles T. Cleveland and Stuart L. Farris. "Toward Strategic Landpower," *Army* 63, no. 7 (July 2013): 21, accessed November 13, 2014, <http://search.proquest.com/docview/1398811970>.

²⁸ Charles T. Cleveland and Stuart L. Farris, "Knowledge is Power: Adaptations Required to Survive in the Human Domain," *Army* 64, no. 7 (July 2014): 40, accessed August 16, 2014, <http://search.proquest.com/docview/1543044132>.

current technology in concert with increasing investment in human capital reinforces organizational adaption.²⁹

The US Army's refocusing toward population-centric warfare has led the Army Capability Integration Center (ARCIC) to produce three functional concepts aimed at improving capabilities to operate in the human domain. The first initiative is a global landpower network, described by the US Army Special Operations Commander (USASOC), Lieutenant General Charles Cleveland, as building the relationships between the US Army and its "allies, expeditionary global and regional partners, and host-nation forces bound by the common interests of peace, liberty, regional stability, and global prosperity."³⁰ This concept relies on persistent engagement to build trust and collaboration, while understanding strategic value of action or inaction within the situation's context. The common interests of all partners are interdependent, in which no single partner has leverage over the other, forcing a need and creating benefits for collaboration.³¹ The second initiative creates a seventh warfighting function – engagement – described in the "US Army Functional Concept for Engagement" as uniting "the tasks and systems that provide lethal and nonlethal capabilities to assess, shape, deter, and influence the decisions and behavior of security forces, governments, and people."³² Human domain provides

²⁹ Mark Gorenflo and Mark R. Hagerott, "The Shifting Domain of War," *United States Naval Institute Proceedings* 132, no. 11 (November 2006): 43, accessed November 3, 2014, <http://search.proquest.com/docview/205983646>.

³⁰ Charles T. Cleveland and Stuart L. Farris, "A Global Landpower Network could be the Ultimate Anti-Network," *Army* 64, no. 8 (August 2014): 57, accessed November 13, 2014, <http://search.proquest.com/docview/1552835057>.

³¹ Ibid.

³² Engagement is currently only used within the US Army. The other Joint and Army warfighting functions are maneuver, fires, intelligence, sustainment, protections, and mission command (command and control is used in Joint doctrine in lieu of mission command). Training and Doctrine Command Pamphlet (TRADOC PAM) 525-8-5, "US Army Functional Concept for Engagement" (Washington DC: Government Printing Office, 2014), 7.

the cognitive framework for incorporating engagement as a process, supported by improved mental, physical, and social aspects of soldiers through the human dimension.³³ In May 2014, the US Army published its third initiative an updated “Human Dimension Concept.” The update to the Human Dimension focused on formalizing and overseeing several ad hoc initiatives to improve soldier performance under a common program. Improved soldier performance has three main aspects: cognitive, physical, and social. The “Human Dimension Concept” intends to develop soldiers with the mental abilities to assess and make decisions, the physical abilities to maximize performing functional roles, and the social abilities to integrate into teams and build relationships.³⁴ When combined, engagement, the human dimension, and the global landpower network provides an organizational construct to improve landpower through the synergy of lethal and non-lethal means enhanced by improved soldier performance and allied partnerships.

There are several arguments against approaching the human domain as a warfighting domain. One argument asserts the human domain is not the same as the other physical warfighting domains, because it is largely a cognitive domain and the emerging threat exists primarily in the information and cyber environments.³⁵ Another argument states that prioritizing a view of population-centric warfare limits options and limits understanding of the environment.³⁶ Additionally, while the human domain concept captures the lessons learned in recent conflict in Iraq and Afghanistan, it avoids addressing and improving the weaknesses of military power in

³³ Ibid.

³⁴ Training and Doctrine Command Pamphlet (TRADOC PAM) 525-3-7, “The US Army Human Dimension Concept” (Washington D.C.: Government Printing Office, 2014), 8, 12-15.

³⁵ Jim Gash, “Physical Operating Environments: How the Cyber-Electromagnetic Environment Fits,” *Canadian Military Journal*, 12, no. 3 (Summer 2012): 30, accessed November 12, 2014, <http://www.journal.forces.gc.ca/vol12/no3/page28-eng.asp>.

³⁶ Grant M. Martin, “The Sublime: The Paradox of the 7th Warfighting Function,” *Small Wars Journal*, November 25, 2013, accessed November 30, 2014, <http://smallwarsjournal.com/jrnl/art/the-sublime-the-paradox-of-the-7th-warfighting-function>.

those conflicts.³⁷ Likewise, using a behavior-focused strategy with “pain-pleasure” as its centerpiece serves only to create more conflict.³⁸ A final challenge to the human domain approach contends the Army need only to reinvest in the Foreign Area Officer, Civil Affairs, and Psychological Operations personnel and systems traditionally used in gaining cultural understanding and exercising influence in population-centric warfare, but has neglected and misused in the past.³⁹ Overall, the revisionists approach provides a holistic view of knowledge, influence, activity, and capability development.

The last category of the human domain combines both previous arguments with a narrow scope of improving the integration of conventional forces and SOF in the land domain. This perspective acknowledges the adaptation of special operations and conventional forces to integrate informally on the battlefields of Iraq and Afghanistan.⁴⁰ Initially, this approach advocated for increasing training opportunities and a more compatible doctrine between the US Army and US Army Special Operations Forces (ARSOF).⁴¹

The ARSOF also recommends a delineation of military tasks best performed by special operations with conventional forces in support and vice versa.⁴² ARSOF views the human domain

³⁷ Roy Douglass, “Pursuing the Human Domain Risks Reinvesting on the Basics” (strategic research project, US Army War College, 2013), 2, accessed July 15, 2014, <http://www.dtic.mil/cgi-bin/GetTRDoc%3FAD%3DADA589406>.

³⁸ Carl Osgood, “Behaviorism Invades the US Military” *Executive Intelligence Review*, July 20, 2012, 34-6, accessed March 15, 2015, www.larouchepub.com/eiw/public/2012/eirv39n28-20120720/34-36_3928.pdf

³⁹ Ben Connable, “All our Eggs in a Broken Basket: How the Human Terrain System is Undermining Sustainable Military Cultural Competence,” *Military Review* 89, no. 2 (March 2009): 57-64, accessed December 5, 2014, <http://search.proquest.com/docview/225305986>.

⁴⁰ Sacolick and Grigsby, 40.

⁴¹ Ibid.

⁴² US Army Special Operations Command. “ARSOF 2022,” *Special Warfare* 27, no. 2 (April - June 2013): 5, accessed August 14, 2014, http://www.soc.mil/Assorted%20Pages/ARSOF2022_vFINAL.pdf.

and land domain as interconnected in a spectrum, with some forms of military operations, such as unconventional warfare (UW), counterterrorism (CT), and counter-proliferation (CP) residing in the human domain. Operations requiring combined arms maneuver fall within the land domain, while security force assistance (SFA), counterinsurgency (COIN), and foreign internal defense (FID) reside in both the human and land domains. Figure 1 highlights these distinctions.

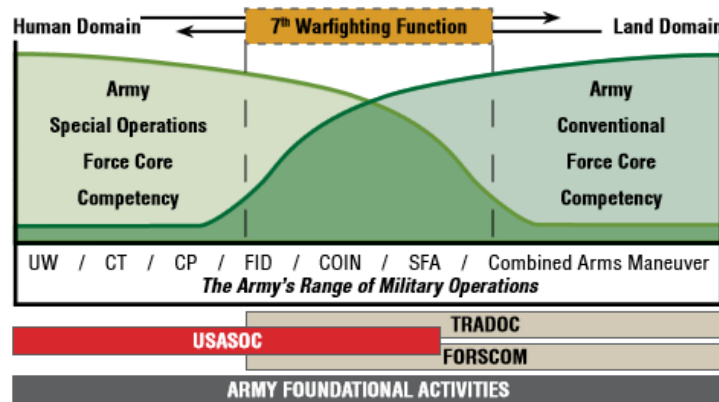


Figure 1. Delineation of Special Operations and Conventional Force Competencies

Source: US Army Special Operations Command, "ARSOF 2022" *Special Warfare* 27, no. 2 (April - June 2013): 5.

United States Special Operations Command (USSOCOM) identifies its organization as designed for operations with the human domain.⁴³ Because of this view, US Army adopted Special Operations as a core competency included with Combined Arms Maneuver and Wide Area Security within its doctrine.⁴⁴ Delineation of roles between SOF and conventional forces

⁴³ United States Special Operations Command, "SOCOM 2020: Forging the Tip of the Spear" (MacDill AFB, FL: Public Affairs Office), 2, accessed December 5, <http://www.defenseinnovationmarketplace.mil/resources/SOCOM2020Strategy.pdf>.

⁴⁴ Charles T. Cleveland and Stuart L. Farris. "Special Operations-An Army Core Competency," *Army* 64, no. 6 (June 2014): 25, accessed December 11, 2014, <http://search.proquest.com/docview/1540742008>.

helps to focus force modernization and training in an environment of constrained budgets.

The US Army's future operating concept "Win in a Complex World," released in October, 2014, includes the five initiatives – HAMO, global landpower network, Engagement, Human Dimension, and the Special Operation core competency.⁴⁵ These initiatives will serve to inform the Army's future innovation in the doctrine, organization, training, material, leadership, personnel, facilities, and policy (DOTMLPF-P) functional areas inside the US Army. The human domain concept helps to spark the thinking required to generate future actions and create the influence required to develop the capabilities to operate in a dynamic environment. In addition, the dialogue surrounding the human domain concept shapes the need for integrating, adapting, and focusing the US military's landpower; key conditions with these actions are interdependency, innovation environment, and division of labor. DOTMLPF-P is the US military's form of organization theory. DOTMLPF-P is the US military's specialized version of organization theory used in social and economic theories. Therefore, business management and leadership theories can provide insights into the potential unintended consequences regarding the human domain initiatives.

⁴⁵ The Joint Staff J-7 did not pursue Human Aspects of Military Operations at the time of release for "Win in a Complex World. However, the idea for increased understanding regarding the human, political, and cultural nature of war conforms to the intent of HAMO. Training and Doctrine Command Pamphlet (TRADOC PAM) 525-3-1, "The Army Operating Concept: Win in a Complex World" (Washington DC: Government Printing Office, 2014), 8.

Organization Theory: Resiliency and Capacity for Independent Operations

The most direct way in which executives operate on the context of reward systems is by choosing the organization's domain. A firm's fitness landscape depends directly on the strategic choice of its niche, its way of making a living. By altering the shape or location of the niche, executives propel their organizations into arenas that channel emergent behavior in novel directions.

– Philip Anderson, “Complexity Theory and Organization Science”

The human domain provides the US military a novel approach to generate the organizational adaptation to contend with the increasing rate of environmental change in a global, interdependent human environment. The US Army has imbedded the human domain initiatives into its new operating concept entitled “Win in a Complex World.” Organization theory governs the internal adaptations required to keep pace with a dynamic environment. Organization theory provides a holistic method to interpret the effects of changes in military systems, which result from changes in people, technology, and processes. The following section defines organization theory and research regarding management phenomenon and principles, which could potentially affect specialized organizational roles, interdependency, and innovation. The organizational and business theories shape the environmental tendencies for organizations experiencing change in new strategic directions. Next, the human domain concept is organized into an operating concept, and the supporting technology and personnel requirements consistent with other warfighting domain approaches. Applying business leadership and management theories to the human domain initiatives’ organizational constructs creates the possibility to anticipate potential consequences. These theoretical consequences support an interpretation of events occurring in the US military’s experiences in population-centric approaches.

Organization Theory as a Lens to the Human Domain Initiatives

Organization theory provides a lens to evaluate the goals of the human domain concept, which are to create organizational adaption for developing greater ability to employ population-centric approaches to warfighting. At its broadest, organization theory states that established

environmental structures shape the technical, economic, and human dynamics of complex organizations filling a social demand.⁴⁶ Organizations behave according to their values or goals, their processes, and hierarchies.⁴⁷ Bureaucracies, such as the US military, are one type of organizational structure, designed to control behavior and maximize efficiency through policy.⁴⁸ These ideas create three control structures for operating the tools, people, and processes in harmony: demand, intra-organization social norms, and bureaucratic policy controls.

The warfighting domains are key aspects of the US military bureaucracy. Each warfighting domain has separate requirements for technology, specialized personnel, and unique operating theories, requiring separate institutionalization and financial support.⁴⁹ Divisions of labor, hierarchies, and specialized roles for individuals are characteristics of bureaucracies.⁵⁰ The use of warfighting domains provides a method to organize the division of labor efforts in developing capabilities and operating efficiency.

Divisions of labor and knowledge improve efficiency by allowing people or groups to specialize in certain roles within a society.⁵¹ The goal of role specialization is to create efficiency, but specialization also eliminates redundancy. Organizations employing special divisions of labor

⁴⁶ William C. Scott and Terence R. Mitchell, *Organization Theory: A Structural and Behavioral Analysis*, 3d ed. (Homewood, IL: Richard D. Irwin, Inc., 1976), 19

⁴⁷ Joe Kelly, *Organizational Behavior: Its Data, First Principles, and Application*, 3d ed. (Homewood, IL: Richard D. Irwin, Inc., 1980), 24.

⁴⁸ Joseph Soeters, Paul van Fenema, and Robert Beeres, "Introducing Military Organizations," in *Managing Military Organizations: Theory and Practice*, ed. Joseph Soeters, Paul van Fenema, and Robert Beeres (New York: Routledge, 2010), 6.

⁴⁹ Allen and Gilbert, 137-8.

⁵⁰ Kelly, 49.

⁵¹ Mary Jo Hatch and Ann L. Cunliffe, *Organization Theory: Modern, Symbolic and Postmodern Perspectives*, 2d ed. (New York: Oxford University Press, 2006), 27-30; Lucie Tanguy "Academic Studies and Technical Education: New Dimensions of an Old Struggle in the Division of Knowledge," *Sociology of Education* 58, no. 1 (January 1985): 21.

and knowledge possess interdependencies between each of the distinct divisions to achieve the overall goals. Organizations without redundancy and with interdependencies are subject to volatility during change.⁵² Bureaucratic organizations in a dynamic operating environment face a dilemma between seeking efficiency and maintaining the inefficient redundancies required to remain resilient to the environmental volatility.

Specialization increases efficiency, but also contributes to intra-organizational conflict and stressors among individuals. Role conflict occurs when people or groups with more than one role in an organization face competing demands between incompatible roles. The preferred method for those facing a role conflict is to develop a novel adaptation to accomplish both roles simultaneously using different ways and leading to innovation. However, organizational processes and structures, binding the actor to act in a certain way, may constrain an actor from implementing a novel idea. If the person is unable to adapt, he or she will attempt to ignore one of the competing roles and focus on the other by reducing effort in the role perceived as less important or less likely to incur risk.⁵³ If unable to change methods or slack in a competing demand, the worker's stressors increase and job satisfaction declines.⁵⁴ Role conflict, if properly managed to allow novel ideas and concepts to emerge, can contribute to innovation.

Innovation has the opportunity to emerge from the intra-organizational conflict generated by a change in strategic direction if a conducive environment for adaptation and creativity exists and is valued within the organization. Using conflict management leverages the tensions between

⁵² Yaneer Bar-Yam, *Making Things Work: Solving Complex Problems in a Complex World* (Cambridge, MA: NECSI Knowledge Press, 2004), 49.

⁵³ Kelly, 257-8.

⁵⁴ Michael A. Campion, Troy V. Mumford, Frederick P. Morgeson, and Jennifer D. Nahrgang, "Work Redesign: Eight Obstacles and Opportunities," *Human Resource Management* 44, no. 4 (2005): 380-81, accessed March 25, 2015, <http://search.proquest.com/docview/621006283>.

conflicting roles or concepts and propels creative thinking and intra-organizational dialogue.⁵⁵ New strategic directions for businesses inherently create role conflict, but various organizational controls, such as centralized, social, and demand based control systems, relieve tensions and enable further expansion.⁵⁶

As expansion occurs, individuals within the organization encounter more and different demands, in a phenomenon known as job enlargement. Job enlargement acts against specialization and produces greater, broader skills in employees.⁵⁷ Job enlargement gives more autonomy to subordinates and dampens the stress caused by specialization; by contrast, too much ambiguity in the expanded role produces the same effects as role conflict.⁵⁸ Innovation during expansion requires fostering a conducive environment, which creates the best conditions to manage conflict. An innovative environment requires promoting stable structures, risk acceptance, and organizational change, while avoiding bureaucratic policy to define, regulate, and reward behavior.⁵⁹ In bureaucratic institutions, specialized knowledge and constrained activity degrade the ability to innovate.

Expansion and innovation can also cause gaps in knowledge and capability for activity. These gaps require investment in capacity to maintain the emerging demands or outsourcing to

⁵⁵ John P. Kotter, *Power and Influence: Beyond Formal Authority* (New York: The Free Press, 1985), 33.

⁵⁶ Steven W. Floyd and Peter J. Lane. "Strategizing Throughout the Organization: Management Role Conflict in Strategic Renewal." *The Academy of Management Review* 25, no. 1 (January 2000): 167-168, accessed March 16, 2015, <http://search.proquest.com/docview/210977665>.

⁵⁷ Scott and Mitchell, 40.

⁵⁸ Campion, et al., 380.

⁵⁹ John H Marburger, "Science, Technology, and Innovation in a 21st Century Context," *Policy Sciences* 44, no. 3 (September 2011): 213, accessed December 5, 2014, <http://search.proquest.com/docview/899186083>.

other organizations. James March, a noted managerial professor, describes the process of contracting knowledge and expertise: “As organizations move toward knowledge and competence inventories that are represented by markets in contract services, rather than a collection of in-house skills, the politics of knowledge acquisition and utilization becomes particularly germane to intelligent decision engineering.”⁶⁰ With knowledge as power, experts gain potential leverage over supported organizations through setting agendas and controlling narratives. This leverage means that building resiliency and avoiding risk requires building the capacity to maintain the skills and knowledge required to sustain performance in innovation or creating symbiotic relationships with those who provide outsourced knowledge.⁶¹

As organizations expand into new realms of operation and knowledge, the theoretical factors covering intra-organizational conflict, innovation, capacity building create implications for the human domain. Bureaucratic institutions tend to avoid risk and promote stability. The interdependencies within an organization operating under a division of labor and knowledge create intra-organizational conflicts. Avoiding conflict and risk, in turn causes sub-organizations to avoid interdependencies. Decentralized innovation, fueled by stress and conflict, causes the emergence of capability and knowledge gaps, and the methods in which innovators fill these further amplify the tendency to adapt from interdependent functions into more autonomous, resilient organizations. In order to apply these potential trends to the human domain requires understanding the organizational influences of the human domain initiatives.

Building a Human Domain Organization

Domains provide a method of organization for the US military. Each domain has distinct

⁶⁰ James March, *A Primer on Decision Making* (New York: Free Press, 2009), 255.

⁶¹ Peter Senge, *The Fifth Discipline: The Art & Practice of the Learning Organization*, 2d ed. (New York: Doubleday, 2006), 400; Robert Jervis, *System Effects: Complexity in Political and Social Life*, 3d ed. (Princeton, NJ: Princeton University Press, 1999), 162.

operating concepts, along with specialized personnel requirements and appropriate technologies to achieve the desired goals. This section traces the military organizational concept from the theoretical origins in the aim and purpose of military power to the potential application in the human domain. The methods used to organize the military provide the logic behind the human domain initiatives and their interconnectedness.

The previous section of this paper introduced Dolman's theory on the utility of the warfighting domains in focusing the development of operational capacity. In his theory, Dolman argues, "the purpose of airpower is to command the air...to be able to maximize the violence at the discretion of the political authority."⁶² The ability to move freely in an operating realm, relative to the adversary, provides a functional advantage and generates an effect on the enemy decision-makers to deter or compel action.⁶³ While Dolman creates his theory primarily from the air domain, the land and sea domains use a similar logic of control or command.

Similar to Dolman, Professor Milan Vego, of the US Naval War College, defines the command of the sea as the "complete, absolute, and permanent control of a specific part of the ocean or sea area, thereby ensuring one's free use of sea communications and full denial of it to the adversary."⁶⁴ By contrast, sea control is an advantage over the adversary to maneuver freely in support of objectives within a limited time and space.⁶⁵ Determining the degree of control, whether complete or limited, depends, as Dolman says, on the granted political authority. The degree of control also depends on the available resources, which can be committed to securing

⁶² Dolman, *Pure Strategy*, 34.

⁶³Ibid., 35. See also, Barry Blechman and Stephen Kaplan, *Force Without War: The US Military as a Political Instrument* (Washington DC: Brookings Institution Press, 1978), 71.

⁶⁴Milan Vego, *Operational Warfare at Sea: Theory and Practice* (New York: Routledge, 2009), 24.

⁶⁵Ibid., 25.

command vice control, or the adversary's capability to contest the specific area.⁶⁶

Both Dolman and Vego's defined goals for air and seapower are rooted in Prussian military theorist Carl von Clausewitz theoretical aim of military power in war.⁶⁷ With an emphasis on landpower, Clausewitz defined this aim as "disarming the enemy" by defeating the opposing military, occupying territory, denying resources, and breaking the opponent's will to resist.⁶⁸ Clausewitz also states that limited disarmament may be required, if political solutions arise before militaries dissolve, resources run out, or the will to continue to resist completely breaks.⁶⁹ Likewise, the resources or cost required to secure a political solution restrict the effort.⁷⁰ The theoretical purpose of each domain includes establishing a relative advantage over the adversary, controlling areas, and achieving effects and objectives congruent with the political aims and available resources. These ideas influence the function and form of the human domain, because of its focus on population-centric approaches.

The US military defines four stability mechanisms used in population-centric approaches: control, influence, support, and compel. Control uses physical occupation to coerce or assure a population's physical behavior changes or remains the same, respectively. Influence uses non-lethal means to induce psychological change in opinions or thoughts. Support improves or maintains the environmental conditions that affect stability. Compel combines the effects from

⁶⁶ Julian S. Corbett, *Some Principles of Maritime Strategy* (London: 1911), 38, 224, accessed June 11, 2014, <http://www.gutenberg.org/files/15076/15076-h/15076>.

⁶⁷ Dolman uses Clausewitz directly, while Vego uses Sir Julian Corbett. Corbett derived his theory on limited command of the sea from Clausewitz. See David Jablonsky "Editors Introduction," in *Roots of Strategy Book 4*, ed. David Jablonsky (Mechanicsburg, PA: Stackpole Books, 1999), 155.

⁶⁸ Carl von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 90.

⁶⁹ *Ibid.*, 91

⁷⁰ *Ibid.*, 93

control and influence to create a physical and psychological behavioral change within the populace. In an operational approach, multiple mechanisms interdependently shape conditions to achieve desired effects or objectives.⁷¹ Building the capability through the tools, people, and processes required to employ these stability mechanisms drives the organization of the US Army under the human domain concept.

The “US Army’s Functional Concept for Engagement” frames the organizational changes required to improve the US Army’s capabilities in population-centric warfare, in particular to compel populations. Like Dolman’s purpose for a specific domain power, engagement’s role in ARCIC’s functional concept is to “gain and maintain strategic and operational access, facilitate operational and tactical movement and maneuver, and shape the operational environment for successful unified land operations.”⁷² Engagement uses the lethal and nonlethal effects of military operations to change behavior, in order to achieve political and strategic aims.⁷³ Like the idea of command of the air or command of the sea, the engagement warfighting function’s purpose is to influence control and freedom of maneuver in the human domain.⁷⁴ The functional concept also addresses the people and tools required to build the knowledge and activity required to generate the influence through engagement.

The “US Army’s Functional Concept for Engagement” acknowledges several requirements for improving the human resources within the Army concerning the specialized requirements for operating in the human domain. In particular, the US Army will require leaders

⁷¹ JP 5-0, III-30-31.

⁷² TRADOC PAM 525-8-5, 28.

⁷³ Ibid., 7.

⁷⁴ As an example of sea control used as an analogy for conducting operations in the human domain, see Joseph D. Celeski, "SOF, the Human Domain and the Conduct of Campaigns," *Special Warfare* 27, no. 3 (July 2014): 5-9, accessed January 21, 2015, <http://search.proquest.com/docview/1561988159>.

with social and cultural awareness, and a proficiency in foreign languages. Education and experience must be mutually supporting and will drive the assignments of soldiers. The experiences should also consist of work in external government and civic enterprises to build in-house skills necessary for population-centric approaches to warfare. The functional concept also incorporates the ideas from the human dimension concept.⁷⁵

While the engagement warfighting function focuses on some specialized personnel requirements for operating in the human domain, the human dimension focuses on general aspects of increasing soldiers' individual mental, physical, and social attributes. The human dimension supports engagement in two significant ways. The first way is building the mental and physical resiliency to sustain the rigors of combat stress.⁷⁶ The second way is a level of social competence (not necessarily cultural competence) to understand operating environments and develop relationships between the joint, interagency, inter-governmental, and multinational (JIIM) actors in any future conflict or security environment.⁷⁷ Improving soldiers' ability to manage stress and build networks are key to the human dimension's objectives of increasing learning abilities, expanding competencies, developing creative and critical thinkers, and leveraging US military advantages. The human dimension concept is not exclusive to population-centric warfare; it supports individual readiness and resiliency across all task ranges and specialties within the US Army to include the operation and maintenance of military technologies.⁷⁸

The engagement warfighting function and the human dimension largely focus on the

⁷⁵ Ibid., 32-33.

⁷⁶ TRADOC PAM 525-3-7, 16, 25-6.

⁷⁷ Ibid., 15.

⁷⁸ Ibid., 13.

human aspects and capabilities in warfare. However, improvements in technology and equipment support the development of both concepts. Both engagement and the human dimension concepts focus capability development in science and technology on the areas of communications, behavioral science, and medicine.⁷⁹ Engagement requires the science and technology employed for understanding and anticipating the external social and cultural environment, while the focus of the human dimension uses science and technology to assess and improve the internal readiness and fitness of the US Army.⁸⁰

Combined, the human domain initiatives – engagement and human dimension, along with HAMO and the global landpower network – organize an operating concept to control and maneuver within the human environment. Engagement produces the influence of human behavior, supported by specialized personnel with the knowledge in the human aspects and technology to operate in a human domain. HAMO supports building the knowledge capacity and integration of the joint force, while the global landpower network allows greater depth and breadth from allies and partners in future operations. However, the definition provided in the US Army doctrine links engagement to actions in the land domain. Additionally, “Win in a Complex World,” the US Army’s Operating Concept, incorporates the human domain initiatives along with the traditional warfare methods. The US Army’s Operating Concept prioritizes the mutual concepts, which exists between traditional and population-centric methods of warfare.⁸¹

The human domain allows the US military to capture the specific organization requirements for population-warfare methods. This new perspective provides a focus for investment in capabilities and shapes the organizational design of the US Army. The new direction toward population-centric warfare and organization of the US Army will theoretically

⁷⁹ TRADOC PAM 525-8-5, 9.

⁸⁰ TRADOC PAM 525-3-7, 13-14.

⁸¹ TRADOC PAM 525-3-1, 8-9.

create an environment of intra-organizational conflict, stress, and new gaps in capabilities. In this environment, innovation and new roles within the organization will form, but there is a greater propensity to avoid interdependency and build resilient organizations. The US military's recent experiences, from the 1993 humanitarian intervention in Somalia to operations in Iraq and Afghanistan, provide evidence to support the theoretical trends, which will be examined in the next section.

Conflict, Innovation, and Expansion: Trends for the Future?

As the US Army adopts a greater focus on population-centric warfare, role conflict, innovation, and expansion are, in organization theories inevitable and even desirable. This section applies past evidence from trends in population-centric operations to the areas of role conflict, innovation, and role expansion.

Theoretically, role conflict occurs when an individual's assumptions of his or her role and knowledge are challenged by the demands of the job. The effects of intra-organizational conflict are double-sided. In one way, the conflict can create change. In another way, the conflict can create stress, dissatisfaction, and poor job performance. Congressional Researcher Andrew Feickert noted in a report to the US Congress on the US Army's approach to combining the conventional and population-centric approaches to warfare: "In theory, the Army would be required to maintain a high-level proficiency for four [conventional combat, stability, counterinsurgency, and training/advisory] distinctly different and, some might argue, mutually exclusive missions. This being the case, some might argue that the Army runs the risk of becoming a 'jack of all trades, master of none' force."⁸² The potential for role conflict exists as the US Army must adapt its operations and organizations, but this is not new.

Boston University Psychologist Brett Litz identifies a small, but significant group of

⁸² Feickert, 17.

veterans who developed Post Traumatic Stress Disorder after returning from the peacekeeping operations in Somalia. Litz's conclusions "suggest that there are differences between such experiences and traditional war zone exposure. In the case of Somalia, such differences include ambiguous, inconsistent, or unacceptable rules of engagement; lack of clarity about the goals of the mission itself; a civilian population of combatants; and inherently contradictory experiences of the mission as both humanitarian and dangerous."⁸³ By contrast, in Iraq and Afghanistan, the frustration of being unable to adapt due to conflicts with leadership resulted in a large exodus of junior Army Officers from the Army.⁸⁴ The efforts of the human dimension to increase cognitive, social, and physical performance with in the US Army's soldiers can dampen the effects of stress and ambiguity. These efforts enhance the natural tendency to adapt and innovate, while also promoting leaders willing to accept innovation.

Professor James Russell of the Naval Postgraduate School, in his book *Innovation, Transformation, and War : Counterinsurgency Operations in Anbar and Ninewa Provinces, Iraq, 2005-2007* presents case studies where US military units innovated new organizational design and tactics for counterinsurgency prior to the US Army's adoption of a population-centric approach and organizational capacity to execute. Russell concludes these innovative units succeeded because of their willingness to adopt new processes, organizational structures, activities, knowledge, and technology.⁸⁵ While Russell focuses on the creative tactical

⁸³ Brett T. Litz, et. al., "Posttraumatic Stress Disorder Associated with Peacekeeping Duty in Somalia for U.S. Military Personnel," *The American Journal of Psychiatry* 154, no. 2 (February 1997): 184, accessed March 19, 2015, <http://search.proquest.com/docview/220472511>.

⁸⁴ Andrew Tilghman, "The Army's Other Crisis." *The Washington Monthly* (December 2007): 46, <http://search.proquest.com/docview/213691894>.

⁸⁵ James A. Russell, *Innovation, Transformation, and War: Counterinsurgency Operations in Anbar and Ninewa Provinces, Iraq, 2005-2007* (Palo Alto, CA, USA: Stanford University Press, 2010), 196-204, accessed March 19, 2015, ProQuest ebrary.

innovations, Army War College Professors Charles Allen and Steven Gerrras argue that the key to successful innovation is developing a cohesive approach through critical thinking from the various creative ideas.⁸⁶

While evidence suggests the US Army developed, and continues to develop, an innovative culture, other key JIIM partners might not possess the ability to innovate. In a collection of case studies on NATO adaptability in Afghanistan, Russell and Netherland's Defense Academy Professor, Commodore Frans Osinga, assert NATO partners adapted and innovated at a much different rate than the United States. The political and cultural obstacles to innovation above the tactical level left NATO without the ability to develop a coherent strategy in Afghanistan.⁸⁷ As part of a global landpower network, the US military's increased ability to innovate, particularly tactically, could be hindered by the inability to employ operational approaches requiring a flexible and adaptable coalition. Focusing on employing partners relative to their strengths in an overall approach will mitigate the potential imbalance in innovation, but will still result in capability gaps.

The US military's expansion into unforeseen roles to fill gaps in capability required to secure emerging opportunities occurred frequently in Iraq and Afghanistan. Secretary of Defense Robert Gates addressed the U.S. Global Leadership Campaign in a speech on July 15, 2008. In his speech, he describes the increased role of the US military in what was "perceived to be the

⁸⁶ Charles D. Allen and Stephen J. Gerrras, "Developing Creative and Critical Thinkers," *Military Review* 89, no. 6 (November 2009): 83, accessed March 19, 2015 <http://search.proquest.com/docview/225311838>.

⁸⁷ Frans Osinga, and James Russell, "Conclusion: Military Adaptation and the War in Afghanistan" in *Military Adaptation in Afghanistan*, ed. Theo Farrell, Frans Osinga, and James Russell (Palo Alto, CA, USA: Stanford University Press, 2013), 311, accessed March 20, 2015, ProQuest ebrary.

exclusive province of civilian agencies and organizations.”⁸⁸ Gates called for increased investment in the civilian and bureaucratic capabilities to build the necessary capacity for employing a whole of government approach to the future security dilemmas facing the United States.⁸⁹ In a 2011 a Joint Special Operations University conference on the role of SOF in national power, the attendees concluded that one area of SOF focus is in “cross domain gaps,” both from a military standpoint and from other forms of national power, such as diplomatic, informational, and economic power. “SOF Power” accomplishes strategic and political objectives that other agencies do not possess the ability to confront directly.⁹⁰

In a similar vein, Air Force Lieutenant General David Deptula calls for reforms to create greater interdependence between the military services. He notes that the Air Force sent truck drivers to Iraq, while the Army established programs to develop and train operators for unmanned aerial vehicles, with similar capabilities of those in the Air Force. He argues, “The goal is to provide a highly developed array of specialized capabilities from which the JFC can choose, without suffering from either significant overlap or gaping holes, or conflicting concepts of operations.”⁹¹ Additionally, he states interdependence is a requirement not just within the military, but also in an “integrated architecture that optimizes capabilities in the [diplomatic,

⁸⁸ Robert M. Gates speech to U.S. Global Leadership Campaign, Washington DC, July 15, 2008, accessed March 20, 2015, <http://www.defense.gov/speeches/speech.aspx?speechid=1262>.

⁸⁹ Ibid.; See also, Department of Defense, *National Defense Strategy* (Washington DC: Government Printing Office, June 2008), 17, accessed March 20, 2015, <http://www.defense.gov/news/2008%20National%20Defense%20Strategy.pdf>

⁹⁰ Joseph Celeski, “SOF-Power Workshop: A Way Forward for Special Operations Theory and Strategic Art,” (conference report from Joint Special Operations University’s SOF-Power Workshop, MacDill AFB, FL, August 22-23, 2011), 15, accessed July 21, 2014, <https://jsou.socom.mil/Documents/SOF-Power%20Workshop%20Final.pdf>.

⁹¹David A. Deptula, "Toward Restructuring National Security," *Strategic Studies Quarterly* 1, no. 2 (Winter 2007): 8, 13, accessed December 5, 2014, <http://search.proquest.com/docview/1429243548>.

informational, and economic realms] – an architecture that melds these capabilities in the context of long-range strategies and plans to defeat the broader spectrum of threats facing the nation.”⁹² In JIIM environments, the desire or ability for independent solutions to gaps in capability triggers avoidance of interdependencies.

The future adaptations within the human domain and the inherent tensions between the paradigms of traditional and population-centric warfare organizational models have the potential to create role conflicts, innovation, and expansion. The theoretical reactions to this conflict threaten the goals of the human domain concept to integrate and focus the interdependent roles of JIIM partners in population-centric approaches. Deptula’s argument that the US military Services have become too independent warrants further investigation into the theoretical patterns of conflict, innovation, and expansion in the history of sea, air, space, and cyber developments.

Histories of Domain-centric Warfare: Avoiding Interdependencies

The evolution of the US military in domains other than land can also provide insights into the obstacles and approaches used to expand the knowledge, activity, and influence in the corresponding physical realms. While historical examples are limited to draw definite conclusions, focusing on the ability to integrate innovation and adaptation within shifts in strategic direction in other warfighting domains can provide additional insights to the potential effects of the human domain initiatives.

This section presents three cases regarding periods of expansion in the sea, air, and the technological domains of space and cyber. Between the end of the American Civil War and the Spanish-American War, the American Navy dealt with the problem of integrating steam power in a period of early globalization and expansion. As a growing power, the United States faced a capability gap and underinvestment in the personnel and equipment over potential adversaries in

⁹² Ibid.

an increasingly interdependent world of political, economic, and military power. The air domain provides another example of expansion into a new realm. Evolving from the US Army and Navy, underinvestment, competition, and bureaucratic tensions constrained the innovation, adaption, and expansion of the United States' air formations prior to World War II. The space and cyber domains still adapt toward their niche, but share many similarities and some inconsistencies with the expansion of the air and sea domains.

Each subsection introduces the background to expansion with particular focus on the aims and threats forcing the need to adapt. The aims and threat provide the logic behind organizational adaptations and obstacles in developing operating concepts, technological innovations, and investment. Finally, the assessment of historical performance in combat of the organizational adaptations and obstacle demonstrates the effects regarding integration, adaptation, and focus of the knowledge, actions, and influence in the respective domains.

The US Navy 1865 – 1898: Building Influence and Power

At the conclusion of the Civil War, the US Navy's role focused on defending the American coast and inland waterways. Increasingly, American maritime economic and trade market interests stood aside for European powers, such as Spain and Great Britain, who possessed superior technology and operational reach.⁹³ In a period of early globalization, the United States slowly became more aggressive with its foreign policy, thus popular support for expansion and naval development grew.⁹⁴ Three influential naval leaders, Admirals David Porter, Stephen Luce, and Robert Schufeldt, attempted to modernize the US Navy to meet future demands, despite

⁹³Kenneth J. Hagan, *American Gunboat Diplomacy and the Old Navy, 1877-1889* (Westport, CT.: Greenwood Press, 1973), 6-7.

⁹⁴George C. Herring, *From Colony to Superpower: U.S. Foreign Relations since 1776* (New York: Oxford University Press, 2008), 303-305.

paltry support from US policy makers.⁹⁵

In 1890, American naval theorist Alfred T. Mahan captured this zeitgeist of expansion and naval dominance in *The Influence of Sea Power Upon History 1660-1783*. By exploring Britain's rise to the world's premier naval power, he concluded a nation with command of the sea has strategic advantage over threats to "strangle their commerce and industry with her overwhelming naval strength."⁹⁶ Mahan argued the United States possessed the inherent attributes to build the capacity to evolve into a great seapower, but lacked the political will to invest.⁹⁷ His writings influenced not only the American policy makers, but also created a previously absent strategic vision by advocating for a comprehensive grand strategy, which united seapower, economics, and international relations.⁹⁸ As an example, the United States' ability to gain superior naval power in both the Atlantic and Pacific Oceans led to a belief that an Anglo-American alliance was essential for national security.⁹⁹ In addition to a grand strategy, Mahan also focused the potential future operations, from which to develop the US Navy's organizational construct.

The potential mission sets of navies for Western powers consisted attacking adversary fleets, blockading ports, commerce raiding, landing operations, and challenging stronger

⁹⁵Hagan, 20.

⁹⁶Alfred T. Mahan, *The Influence of Sea Power Upon History 1660-1783*, 12th ed. (Boston: Little, Brown & Company, 1918), 524, accessed June 10, 2014, <http://www.gutenberg.org/files/13529/13529-h/13529>.

⁹⁷ Ibid., 29-89.

⁹⁸Herring, 298; Jon T. Sumida, *Inventing Grand Strategy and Teaching Command: The Classic Works of Alfred Thayer Mahan Reconsidered* (Washington, DC: Woodrow Wilson Center Press, 1997), 99-100.

⁹⁹ Sumida, 88-92.

adversaries through a “fleet in being” or counterattacks.¹⁰⁰ Mahan’s preference was an absolute command of the sea established through the enemy fleets’ destruction. Once the enemy fleet was destroyed, blockades controlled the ports used for trade, effectively isolating overseas commerce. Destroying commerce at sea required dispersing cruisers, which provided the adversary ability to counter with armed convoys of shipping. Eventually, the escalation resulted in increasingly larger squadrons of cruisers required to attack enemy convoys. Finally, Mahan found amphibious operations dangerous because of the risk involved and the increased requirement for sustaining operations, which put a fleet at risk.¹⁰¹ As the US Navy focused its future approach to meet the demands and potential threats, technological innovation and institutional adaptation began to develop the required organizational capabilities.

Technological developments, even prior to Mahan’s call to action, focused on closing the disparate capability gap between the US Navy and its adversaries. The powerful European states possessed the capacity to produce ships with rifled cannon and armored hulls, while the Americans relied on smoothbore cannon and wooden sailing ships. Additionally, the colonies of these nations provided resupply points for the coaling stations to fuel the steam-powered ships.¹⁰² Despite underfunding and lacking industrial ability to compete with the European navies, the US Navy innovated through torpedo technology to offset the gap in armament. It also developed four hybrid cruisers, the *Atlanta*, *Boston*, *Chicago*, and *Dolphin*; these new steam ships retained masts and sails to overcome the logistics problems caused by a lack of basing for coal resupply.¹⁰³ As

¹⁰⁰ A “fleet in being” is a fleet, usually under protection of coastal defenses, making it safe from attack by adversary ships. Corbett, 165-6.

¹⁰¹ Sumida, 44-47.

¹⁰² Hagan, 6.

¹⁰³ William M. McBride, *Technological Change and the United States Navy 1865-1945* (Baltimore: Johns Hopkins University Press, 2000), 19.

the level of political support and investment in the US Navy increased, the ability to compete with European technology became possible. However, this required a shift in the institutional knowledge and desired skill sets within the US Navy.

In 1842, the US Navy created an Engineering branch to oversee ship construction and power generation.¹⁰⁴ As the demand for naval technological knowledge increased, new concepts emerged, which conflicted with the traditional approach to tactics and strategy in the US Navy. A traditionalist clan developed within the US Navy. The traditionalists, as naval historian Professor William MacBride describes, sought a “way to prevent the engineering tail from wagging the sea dog was to control rigidly the activities of naval engineers from the minute they entered the naval service.”¹⁰⁵ The opening of the Naval War College in 1884 provided an opportunity to balance officer development. Admiral Luce and his acolyte, Mahan, focused on an education program designed to incorporate the directed technical education required to transition to a modern navy and the art of command learned through naval history.¹⁰⁶

Because of the debate between the continuities and change in naval warfare, along with a venue of education, the cognitive tensions amongst naval officers developed from the US Navy’s new direction, revealed more potential obstacles to growth. One obstacle was the lack of investment in the United States’ merchant marine fleet. In 1861, the government discontinued subsidizing America’s seafaring merchants. As a result, ship building capacity, overseas economics, experienced sailors, and a strategic depth of ships for transports and tenders during

¹⁰⁴ John B. Hattendorf, B. Mitchell Simpson, and John R. Wadleigh, *Sailors and Scholars: The Centennial History of the US Naval War College* (New Port, RI: Naval War College Press, 1984), 6.

¹⁰⁵ McBride, 20.

¹⁰⁶ Ibid.; Sumida, 28.

wartime, all of which the new naval development strategy depended, were in short supply.¹⁰⁷

Admiral Luce overcame the deficiency in sailors by instituting an enlisted entry-level training program, but the maintenance of America's merchant fleet was outside the scope of the Navy's influence.¹⁰⁸

The other shortfall in the naval strategy was the ability to conducting landing operations. Naval war college planners, studying the American Civil War and the Mexican-American War in 1848 discovered the synergy between small contingents of Soldiers, who could capture coastal fortifications and enhance a fleet's blockade.¹⁰⁹ The US Navy and the US Army planned joint maneuvers in the Atlantic region between summer and autumn of 1887. However, conflict between Major General John Schofield, commander of the Department of the Atlantic, and Major General Phillip Sheridan, Commanding General of the US Army, threatened the Army's participation in the training.¹¹⁰ Additionally, the availability of Army troops and the Navy Department's insistence the War Department pay for the coal used in troop transport fractured the ability to train in joint operations.¹¹¹ Conversely, a battalion of US Marines participated in month-long landing maneuvers with the US Navy at Key West, Florida. This battalion later became instrumental in the amphibious landings at Guantanamo Bay, Cuba, during the Spanish-American War.¹¹²

¹⁰⁷ Hagan, 49-51; Albert Gleaves, *Life and Letters of Stephen B. Luce, Rear Admiral USN* (New York: The Knickerbocker Press, 1925), 137-140.

¹⁰⁸ Gleaves, 149-50; Hagan, 52.

¹⁰⁹ Holland M. Smith, *The Development of Amphibious Tactics in the US Navy* (Washington, DC: History and Museums Division, Headquarters, U.S. Marine Corps, 1992), 15, accessed March 21, 2015, <http://hdl.handle.net/2027/mdp.39015028462284>.

¹¹⁰ Gleaves, 215.

¹¹¹ Ibid, 213-218

¹¹² Holland Smith, 15.

In 1898, Spain suppressed a colonial rebellion in Cuba, while the United States supported Cuban independence. At the same time, Spain faced a similar insurrection by the native inhabitants of the Philippines.¹¹³ The explosion of the USS *Maine* in Havana, Cuba, triggered the United States attack on the Spanish naval squadrons and fortifications in the Philippines, Guam, Cuba, and Puerto Rico. The Spanish Navy and the colonial fortifications were ill-prepared compared to the US Navy.¹¹⁴ The US Navy's investment, innovation, and adaptation since 1865 proved successful against the Spanish naval squadrons at Manila Bay in the Philippines and in Guantanamo Bay and Santiago, Cuba.¹¹⁵

In the Philippines, the US Asiatic Squadron under Commodore George Dewey destroyed the Spanish Squadron on May 1, 1898.¹¹⁶ The US Army had not mobilized and the limited subsidized merchant fleet required over a week to convert to a transport configuration and load. Once limited shipping was available, only 2500 of the required 12,000 US Regular and Volunteer soldiers and their equipment embarked, while the remaining troops waited for chartered or seized ships to depart the Western United States.¹¹⁷ The lack of response in the US Army and merchant marine put Commodore Dewey in a race against time.¹¹⁸ He faced European naval forces, particularly Germany, potentially entering the war to capture Spain's colonies. Additionally, the

¹¹³ Adjutant-General's Office of the United States, *Correspondence Relating to the War with Spain: Including the Insurrection in the Philippine Islands and the China Relief Expedition, April 15, 1898, to July 30, 1902* vol. 2 (Washington, DC: Center of Military History, U.S. Army, 1993), 651.

¹¹⁴ Miguel A. Fernandez, "The Spanish Navy and the War," in *Theodore Roosevelt, the US Navy, and the Spanish-American War*, ed. Edward J. Marolda (New York: Palgrave, 2001), 21.

¹¹⁵ John Davis Long, *The New American Navy* (New York: Outlook Co., 1903), 1-2.

¹¹⁶ For an account of the battle see, Jim Leake, *Manila and Santiago: The New Steel Navy in the Spanish-American War* (Annapolis, MD: The Naval Institute Press, 2009), 62-74.

¹¹⁷ Adjutant-General's Office of the United States, 644.

¹¹⁸ *Ibid.*, 649.

Filipino insurgents escalated their efforts in fighting the Spanish, increasing the violence and instability. Finally, Spain's more modern and capable ships departed the Spanish ports to challenge Dewey's command of the sea in the Philippines.¹¹⁹ The occupation forces required to secure victory over Spain and return stability to the Philippines did not arrive until July 8, 1898.¹²⁰ While the US Army, Navy, and Merchant Marine lacked synchronization, the cooperation amongst these individual Services was impeccable compared to operations in Cuba.

In Cuba, the American Atlantic Squadron led by Admiral William Sampson blockaded the Spanish Caribbean Squadron at Santiago de Cuba. The campaign in Cuba consisted of two landing operations. The first landing, on June 6, 1898 employed a battalion of US Marines to capture the fortifications at Guantanamo Bay, about 34 nautical miles to the west of Santiago to use as supply base and shelter from hurricanes for the blockade. This landing assaulted the fortifications directly, from a dedicated Marine transport, the *Panther*, under support from naval gunfire.¹²¹

The second landing occurred in Daiquiri, Cuba, where 17,000 US Army soldiers under General William Shafter secured an unopposed beach and marched inland.¹²² Admiral Sampson and General Shafter disagreed on the approach to defeat the Spanish in Santiago. Sampson wanted an assault landing by the US Army to force the Spanish Squadron from the port and into the blockading force. Shafter wanted an unopposed landing, and an overland approach to

¹¹⁹ Carroll S. Alden and Allen Westcott, *The United States Navy: A History* (Chicago: J.B. Lippincott Company, 1943), 309.

¹²⁰ Adjutant-General's Office of the United States, 776.

¹²¹ Holland Smith, 15.

¹²² Ibid.

Santiago.¹²³ Because General Shafter was in control of the transport ships, he ordered the unopposed Daiquiri landings. The US Army succeeded in besieging Santiago and allowing the US Atlantic Squadron to destroy the Spanish Caribbean Squadron as it sallied from the port into the blockade. However, the land contingent's overland approach lacked artillery support and supply due to the hasty loading and movement from Florida.¹²⁴ Additionally, disease and the extended time of combat increased the Army's casualties using an overland approach.¹²⁵ Despite achieving the desired objectives and effects, the interdependencies of the US Army, Navy, and Merchant Marine caused friction and influenced the Navy's lessons learned from the Spanish-American War.

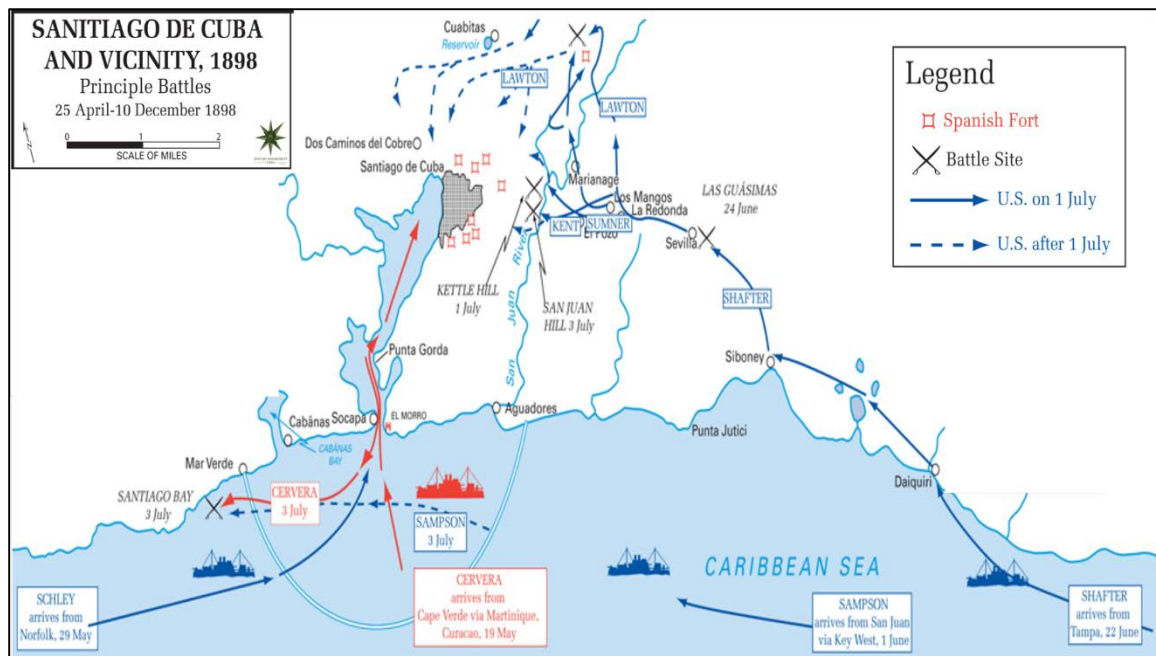


Figure 2. The Battle of Santiago de Cuba

Source: United States Military Academy, *Spanish-American War Atlas*

¹²³ Graham A. Cosmas, "Army-Navy Joint Operations in the Spanish-American War," in *Theodore Roosevelt, the US Navy, and the Spanish-American War*, ed. Edward J. Marolda (New York: Palgrave, 2001), 33.

¹²⁴ Ibid.

¹²⁵ Leeke, 124.

As the naval leaders reviewed the actions of 1898, two key observations led to the US Navy's direction for the future, namely less interdependency with the Army in the future. The first goal, advocated by Commodore Dewey was to expand and employ the US Marines as an assault landing force.¹²⁶ The Marine elements would have dedicated shipping, be better trained, and fall under the direct command of the US Navy. Additionally, while the Army would retain its requirements to contract shipping, the Navy, in particular the Naval War College, saw the need for naval control of Army transports under escort.¹²⁷ The US Navy increasingly desired to expand its role to all aspects of maritime warfare. While the increased knowledge, influence, and activity in the sea proved successful in propelling the US Navy in a direction required by the United States, the innovation, expansion, and focus of the Navy also strained the dependencies on the US Army and Merchant Marine. Five years after the Spanish-American War, new ships – airships – provided a new opportunity and new debate regarding organizing an air force to command the air.

US Airpower 1911-1947: The Need for Independence

In 1783, Joseph and Etienne Montgolfier completed the first hot air balloon flight in France. The United States' military use of flying machines began during the American Civil War, when the Union Army contracted balloons and operators from a Cincinnati, Ohio business for use in reconnaissance and signal missions.¹²⁸ By 1890, the US Army detailed cavalry and engineer officers to the signal corps as balloonists. The Army incorporated aircraft in 1906, three years after the invention of heavier-than-air flying machines. Fixed wing aviation became a permanent

¹²⁶ Holland Smith, 15.

¹²⁷ Hattendorf, Simpson, and Wadleigh, 54.

¹²⁸ Hendrik de Leeuw, *From Flying Horse to Man in the Moon: A History of Flight from its Earliest Beginnings to the Conquest of Space* (New York: St. Martin's Press, 1963) 8, 16.

institution within the military in 1911, when Congress appropriated funds to permanently staff and train Army aviators.¹²⁹

Aircraft provided armies with a unique ability for reconnaissance and communications, and it also possessed other potentials for independent maneuver. Writing on his experiences in the British Army's Royal Flying Corps during World War I, William Robson, pontificated on the future of warfare, when "the aeroplane will be easily the most important and effective weapon which it will be possible to use; but today it is the eyes of the army rather than its weapon. How tremendously powerful it may be when used offensively can be surmised."¹³⁰ The combat in World War I drove the airmen of that period to innovate.

British Air Marshal, Sir John C. Slessor's work, *Air Power and Armies*, describes the evolution of operating theory in World War I. Slessor describes the escalation of unarmed army auxiliary air units to air-ground combat. Once planes became armed, unarmed reconnaissance and signal aircraft needed their own armaments, or better yet, the protection of specifically designed pursuit aircraft. The possibility to use improvised bombs, strafe ground forces, and attack vulnerable rear areas emerged. With the ability to strafe and bomb, it was more advantageous to destroy or degrade enemy aircraft when they were immobile on the ground, than in the air. Nevertheless, committing limited air resources to offensive operations, gave the enemy opportunity to attack rear areas and interdict auxiliary forces. Faced with an attack in depth, Army commanders diverted aircraft from offensive operations to protect rear areas, thereby

¹²⁹ Wray R. Johnson, "Introduction," in *Air Warfare*, by William C. Sherman, reprint (Maxwell AFB, AL: Air University, 2002), vi, accessed November 11, 2014, <http://www.au.af.mil/au/awc/awcgate/au/herman.pdf>.

¹³⁰ Robson, 5.

giving up the pilots' advantage.¹³¹ With the potential for bombing, air interdiction, air-to-air combat, and auxiliary support to armies and navies, many theories arose regarding which concepts to pursue. Most theories of airpower agreed on three things: operations must be offensive, air superiority is a critical requirement, and air forces must be independent of armies and navies.¹³²

Developing airpower within armies and navies constrained air warfare to the institutional history, traditions, and doctrine of those services. As William (Billy) Mitchell, the US Army Assistant Chief of the Air Service, asserted those "older services have been psychologically unfit to develop this new arm to the fullest extent practicable with the methods and means at hand."¹³³ Adapting an air force capable of independent maneuver gave an asymmetrical advantage against an adversarial air arm constrained by support to ground forces. Italian airpower theorist Giulio Douhet argued that an "organized enemy bent on conquering the command of the air would have, and how helpless these auxiliary aerial means employed by the army and navy would be, confronted by an enemy Independent Air Force bent on conquest, inasmuch as no organized opposition would stand in his way."¹³⁴ Gaining and maintaining the freedom of offensive maneuver to exploit advantages in the air became the focus of the operating concepts, which influenced American air development after World War I. These operating concepts were also

¹³¹ John C. Slessor, *Air Power and Armies*, reprint (Tuscaloosa, AL, USA: University of Alabama Press, 2009), 1-25, accessed November 22, 2015, ProQuest ebrary.

¹³² Robert T. Finney "History of the Air Corps Tactical School, 1920-1940" (US Air Force Historical Studies, Air University, Maxwell AFB, 1955), 2-3 accessed March 25, 2015, <http://www.afhra.af.mil/shared/media/document/AFD-090602-019.pdf>

¹³³ William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power--Economic and Military*, in *Roots of Strategy Book 4*, ed. David Jablonsky (Mechanicsburg, PA: Stackpole Books, 1999), 444.

¹³⁴ Giulio Douhet, *Command of the Air*, trans. Dino Ferrari, in *Roots of Strategy Book 4*, ed. David Jablonsky (Mechanicsburg, PA: Stackpole Books, 1999), 305.

influenced by the successful naval renaissance prior to the Great War.

Seapower and naval warfare served to influence early development of air warfare. In 1916, William Robson of the British Royal Flying Corps wrote:

Air power differs from sea power inasmuch as it is not ubiquitous. The British Navy, for example, has obtained absolute command of nearly all the seas and trade-routes in every part of the world, whereas at present it is only possible for even the strongest air fleet to command the air to a strictly limited extent owing to the all-round scarcity, or comparative scarcity, of aeroplanes.¹³⁵

Five years later, Italian airpower theorist Giulio Douhet, in his work *Command of the Air*, recognized the increase of the quality and quantity of aircraft, and their potential uses in influencing both land and sea. To protect from air attack, Douhet argued that, “coastlines are defended from naval attacks, not by dispersing ships and guns along their whole extent, but by conquering command of the seas,” an air force was necessary to ensure freedom of maneuver and exploit dominance of the air against the enemy will to resist.¹³⁶ However, the character of air warfare and air superiority differed from naval combat and command of the sea in many ways. In 1926, American aviator William Sherman, who was influential to Billy Mitchell’s strategic thought on airpower development, asserted, “the corresponding expression of naval warfare, control of the sea, and those who are less familiar with aircraft may easily be led astray by relying on too close an analogy between the two.”¹³⁷ One such way airpower differed from seapower was the flexibility to react to changing and multiple missions in time and space.¹³⁸ Given proper resourcing, air forces could accomplish control of their domain and exploit this advantage on land

¹³⁵ Robson, 16.

¹³⁶ Douhet, 293.

¹³⁷ William C. Sherman, *Air Warfare*, reprint (Maxwell AFB, AL: Air University, 2002), 119, accessed November 11, 2014, <http://www.au.af.mil/au/awc/awcgate/au/sherman.pdf>.

¹³⁸ Slessor, 30; Mitchell, 487.

in a variety of ways, such as bombing, interdiction, and close air support.

For the Army Air Service, getting resources and building a capacity for sustained development, like Mahan had argued 30 years prior with his deterministic traits for seapower, required building a national air enterprise and winning support for investment.¹³⁹ As airpower developed after World War I, Billy Mitchell recognized the unique requirements to develop a military air element: “People who are unused to or unfamiliar with air work are incapable of visioning what air power should be, of training the men necessary for work in the air, or of devising the equipment that they should have.”¹⁴⁰ Mitchell did not only focus on generating the military aspect of airpower, but also in investment in the civil industry – the air enterprise. A healthy air enterprise, like the merchant marine, provided synergistic effects with technology development and a pool of experienced people for recruitment.

In 1919, following World War I, a bill to transform the Army and Navy Air Services into an independent air force entered the Congress, but did not pass legislation. Several similar attempts also failed to create the impetus for change, until 1926, when The Army Air Corps Act became law. This act designated the Army Air Service as the Air Corps and created air staff positions inside the War Department’s General Headquarters (GHQ). The Army Air Corps Act allowed the development of air capabilities outside of the traditional auxiliary role. The Army Air Corps Act authorized a five-year procurement of pursuit (fighter) aircraft and bombers.¹⁴¹

¹³⁹ Chris Wachter, “Air-Mindedness: The Core of Successful Air Enterprise Development,” *Air & Spacepower Journal* (January-February, 2012), 50, accessed March 5, 2015, <http://dtic.mil/cgi-bin/GetTRDoc?AD=ADA555475>.

¹⁴⁰ Mitchell, 499.

¹⁴¹ Legislative actions and their effects on the development of airpower are covered in Carroll V. Glines, “The Long Road to an Independent Air Force,” *Aviation History* 18, no. 1 (September 2007), 30-33, accessed November 25, <http://search.proquest.com/docview/219858420>.

However, the investment into the air arm of the US Army came at a trade-off to investment in the ground components. In 1931, after completion of the five-year investment, General Douglas MacArthur, then the Chief of Staff of the Army, cut five million dollars from the Army Air Corps budget, so as not to risk further degradation in the Army ground force modernization.¹⁴²

The War Department faced a dilemma in investing in competing domains; the Army's mechanization and the Air Corps' aviation requirements created competing demands, and degraded innovation and capacity building. In 1934, President of the United States Franklin D. Roosevelt invested \$7.5 million from the Public Works Administration to maintain the US aircraft industry.¹⁴³ The development towards better engines, heavier payloads, and greater reach required for improving fighter and bomber performance proved irrelevant if the aircraft construction capability within the nation ceased to exist. At the same time the US Army's air component was investing in technology, it was also training and educating personnel.

The first challenge in training and educating airmen came from flight training. The Congressional appropriations in 1911 established a flying school in College Park, Virginia.¹⁴⁴ With the development of the Army Air Service following World War I, the Army invested in an officer school similar to the existing branch schools for artillery or cavalry. Without well-developed theories and experiences in air warfare, the Air Service Tactical School, and later the Air Corps Tactical School, focused its overall instruction and doctrine toward high altitude precision daylight bombardment, the air arms unique contribution to future warfare.¹⁴⁵ Similar to

¹⁴² Rondall Rice, *The Politics of Air Power* (Lincoln, NE: University of Nebraska Press, 2004), 90.

¹⁴³ John F. Shiner, "The Heyday of the GHQ Air Force, 1935-1939," in *Winged Shield, Winged Sword: A History of the United States Air Force*, vol. 1, ed. Bernard C. Nalty (Washington DC: Air Force History and Museums Program, 1997), 136.

¹⁴⁴ Sherman, vi.

¹⁴⁵ Finney, 30-33.

the tensions between the naval engineers and line officers, classes of aviators, auxiliary and air force, developed in the air education program.

In 1941, with authorization from the War Powers Act, the War Department created an operationally, independent air force: the US Army Air Forces through an executive order. This policy renamed the GHQ Air Forces to Air Force Combat Command and gave it authorizations to manage the Army Air Forces in all aspects of organization.¹⁴⁶ The United States entry into World War II drastically increased aircraft production and the mobilization, training, and education of Air Force personnel.¹⁴⁷ While both air and land forces mobilized the additional personnel and equipment required to defeat Germany, Japan, and Italy, the already available resources deployed to North Africa to support the British efforts against the German-Italian operations in the Mediterranean Theater.¹⁴⁸ The North African campaign provided several lessons for the Allied forces including the integration of air and ground forces.¹⁴⁹ At the Casablanca conference in January 1943, the Combined Chiefs of Staff approved the Combined Bomber Offensive (CBO), an air campaign against the German military and economic industrial complexes, which provided an opportunity for a direct approach to Germany while the resources required to invade Europe marshalled in England.¹⁵⁰ The CBO became the US Army Air Force's main effort.

However, bombing industry and economic centers was not appropriate for all theaters in

¹⁴⁶ Glines, 31.

¹⁴⁷ George M. Watson, "Building Air Power," in *Winged Shield, Winged Sword: A History of the United States Air Force*, vol. 1, ed. Bernard C. Nalty (Washington DC: Air Force History and Museums Program, 1997), 231.

¹⁴⁸ Bernard C. Nalty, "The Defeat of Italy and Germany," in *Winged Shield, Winged Sword: A History of the United States Air Force*, vol. 1, ed. Bernard C. Nalty (Washington DC: Air Force History and Museums Program, 1997), 269-270.

¹⁴⁹ Ibid, 278.

¹⁵⁰ Ibid, 279-80.

World War II, in particular, the Italian Theater. After the Allied Forces secured the Italian island of Sicily in August of 1943, the Italian King, Victor Emmanuel III, capitulated and sided with the Allies.¹⁵¹ However, the Germany Army defended the rugged Apennine Peninsula in a series of defensive belts. The Allied Ground Forces, the 15th Army Group, commanded by Field Marshal Harold Alexander ran into the defenses of the Gustav Line centered on Cassino, Italy. The 15th Army Group attempted three assaults on the Gustav Line and an amphibious landing at Anzio to turn the German defense. The Germans contained these attacks and the Allied efforts stalled.¹⁵²

The Commander of Mediterranean Allied Air Forces, US General Ira Eaker, and his deputy British Air Marshal John Slessor employed the concept of air interdiction in Operation Strangle, in Italy from February to May 1944.¹⁵³ Operation Strangle intended to degrade German reserves and supply lines between Rome and Pisa on February 11, 1944, forcing the Germans to withdrawal from their defensive positions. Operation Strangle failed to destroy significant ground forces or supplies, but degraded the German Tenth Army's mobility.¹⁵⁴ The German Tenth Army's isolation provided opportunity in May to combine the left wing of the British Eighth Army and the American Fifth Army's right wing to encircle the Gustav Line defenses at Casino in Operation Diadem. Operation Diadem, along with the Allied breakout at Anzio forced a German retreat from the Gustav Line's defenses to the Gothic Line. Allied Air Forces found ample targets to harass after the German withdrawal from their defensive positions.¹⁵⁵

¹⁵¹ Douglas Porch, *The Path to Victory: The Mediterranean Theater in World War II* (New York: Farrar, Straus, and Giroux, 2004), 467-469.

¹⁵² *Ibid.*, 539-43.

¹⁵³ Corvin J. Connolly, "Marshal of the Royal Air Force Sir John Cotesworth Slessor and the Anglo-American Air Power Alliance, 1940-1945" (PhD diss., University of Texas A&M, 2001), 258-260.

¹⁵⁴ Andrew Brookes, *Air War Over Italy* (Hersham, Surrey: Ian Allen Publishing, 2000), 98.

¹⁵⁵ *Ibid.*

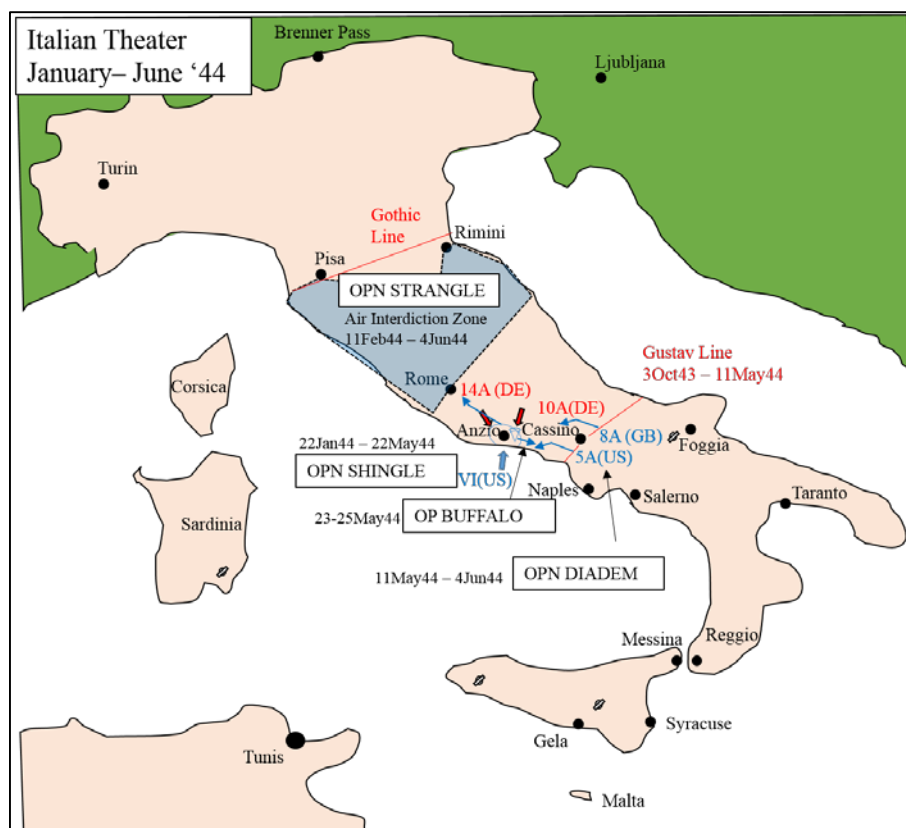


Figure 3. Allied Air and Ground Operations in the Italian Theater 1944

Source: Created by author.¹⁵⁶

The Allied experiences in Operations Strangle and Diadem caused a temporary reevaluation in the perceived relationship between air and land operations among members of the Allied Air Forces. Operation Strangle failed to destroy significant targets, because there were no land attacks to force the Germans to commit their reserves and create a demand for supplies. The Germans constrained minor movements and resupply to the night, and concealed critical forces and supplies during the day. Operation Diadem created the necessary movement in German

¹⁵⁶ Compiled from information in: Porch, 539-43; Brookes, 98; United States Military Academy, "Anzio-Cassino Area 1944," *World War II Atlas*, accessed October 16, 2015, <http://www.usma.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope50.gif>

troops and supplies to create targets for air interdiction.¹⁵⁷ The mutual support between land and airpower created tensions; the problem lay in synchronizing the timing between the effects of land power on ground movement and the interdiction creating the conditions for the successful maneuver on land. The newly identified relationship of land and airpower – interdiction and dislocation – happened too late in the war to gather the important lessons to implement into the Allied operational repertoire.¹⁵⁸ Ultimately, the success of the CBO and the US Air Forces institutional narrative of independent operations overshadowed the potential lessons from Operation Strangle. The United States Air Force's creation in 1947 as an independent organization also laid the groundwork and a developmental path for the technological domains – space and cyber.

Space and Cyber: High Threat and Low Risk

The space and cyber domains share many similarities in their paths of institutionalization to the air domain. Space and cyberspace both started as auxiliary units to other services for reconnaissance and communications. Emerging threats in these domains created the need for investment in the knowledge, activity, and influence required to compete with adversaries in these realms.

Rocket technology, developed during World War II, made the idea of space travel a real possibility. The US Air Force, in its strategic airpower role, developed the US space program in 1948.¹⁵⁹ In 1955, National Security Directive 5520 established the United States policy on

¹⁵⁷ Brookes, 98.

¹⁵⁸ Connolly, 266.

¹⁵⁹ Stares, 28.

maintaining space as an international commons, similar to the sea and international airspace.¹⁶⁰ While nations may restrict access to aircraft over their sovereign territory, orbit in space knows no legal bounds, which created a unique advantage and risk. In 1957, the Soviet Union became the first nation to launch into space. The threat of reconnaissance satellites and nuclear intercontinental ballistic missiles (ICBM) motivated the United States to militarize space under the US Air Force and Navy. By 1985, President Ronald Reagan enacted an executive order, creating a functional unified command, US Space Command (USSPACECOM), to manage military operations in space.¹⁶¹ In 1998, the USSPACECOM issued its vision for 2020, stating that in the “early in the 21st century, space will become another medium of warfare,” equivalent to land, sea, and air.¹⁶² Space’s role in military digital communications through satellite payloads ties it to the cyber domain.

In 1969, Robert Taylor invented the Advanced Research Project Agency Network (ARPANET), the first computer network. By 1975, the US Army transmitted information about American political activists using ARPANET creating a national scandal.¹⁶³ Network control and protection became important to all military services. As threats - and the potential impact from threats - increased, along with opportunities to exploit information in the cyber domain, the value of an independent institution grew. In 2010, the “Quadrennial Defense Review” allocated domain

¹⁶⁰ National Security Council, Report 5520: “Statement of Policy on the US Scientific Satellite Program” (Washington DC: May 20, 1955), 3-4, accessed December 18, 2014 <http://nsarchive.chadwyck.com>; Joint Publication (JP) 3-14, *Space Operations* (Washington D.C.: Government Printing Office, 2013), I-8.

¹⁶¹ Senate Armed Service Committee, *Department of Defense Authorization Appropriations for Fiscal Year 1986*, 99th Congr., 1st sess., S. Doc 99-674 Pt 2, 5-7 Feb 1985, 1118, accessed December 9, 2014, <http://babel.hathitrust.org>.

¹⁶² United States Space Command, 7.

¹⁶³ Christos Moschovitis, Hilary Poole, Tami Schuyler, and Theresa Senft, *History of the Internet: A Chronology 1843 to the Present* (Santa Barbara, CA: ABC-CLIO, 1999), 69, 87.

status for cyberspace: “Although it is a man-made domain, cyberspace is now as relevant a domain for [Department of Defense] activities as the naturally occurring domains of land, sea, air, and space.”¹⁶⁴ As of 2011, Joint doctrine refers to the traditional physical domains land, air, sea, and space domains, and an information environment. The cyber domain is a “global domain of the information environment.”¹⁶⁵

Neither space nor cyber has a fully developed operating concept, but theorists use analogies to seapower as a basis for expanding ideas. Everett C. Dolman’s book, *Astropolitik* uses a similar argument to Mahan, complete with a grand strategy, for the United States to develop capabilities and command the geostrategic chokepoints and critical realms of space.¹⁶⁶ US Navy Commander, John Klein poses, “by expanding naval theory to include broadly maritime concerns, which incorporate the interaction of land and sea, the scope of space operations can be adequately modeled... on the basis of which maritime strategy can be defined and then the principles of space theory developed.”¹⁶⁷ To gain understanding of potential focus within the cyber domain, former Supreme Allied Commander, Europe, US Navy Admiral John Stavridis remarks, “It is interesting to contemplate the comparisons with the maritime domain, particularly within the context of the challenges mankind faced in bringing some order to the untamed

¹⁶⁴ Department of Defense, *Quadrennial Defense Report* (Washington D.C.: Government Printing Office, 2010), 37, accessed November 24, 2014, http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf

¹⁶⁵ JP 1-02, 92.

¹⁶⁶ Everett C. Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (Portland, OR: Frank Cass, 2002), 34,183.

¹⁶⁷ John J. Klein, "Corbett in Orbit: A Maritime Model for Strategic Space Theory." *Naval War College Review* 57, no. 1 (Winter 2004): 59-60, accessed November 20, 2014, <http://search.proquest.com/docview/205935672>.

oceans.”¹⁶⁸ Without a generally agreed upon direction for development, space and cyber rely on the demands for security in those realms.

Space and cyberspace undergo policy reviews to shape these domains’ institutional development. As an example, a 2001 Congressional commission assessed the national organization of the United States’ space programs. The commission did not recommend a separate military space service, citing that “there is not yet a critical mass of qualified personnel, budget, requirements, or missions sufficient to establish a new department,” but future organizational alignments should not preclude a separate service.¹⁶⁹ The 2001 space commission concluded that a model to guide the future institutional structure for the space domain “is the Army Air Forces’ relationship to the Army during World War II.”¹⁷⁰ However, a significant discriminator between space and air domains is the presence of force on force combat, which drove the need for an independent organization.¹⁷¹

Currently, the US Strategic Command (USSTRATCOM) builds operational efficiencies and effectiveness through its unique ability to centrally control and synchronize the strategic operations in the space and cyber realms through its subordinate commands US Cyber Command and USSPACECOM. The Army, Navy, and Air Force generate the technology and human resources for the space and cyber domains in coordination with USSTRATCOM with their service component commands.

¹⁶⁸ James G. Stavridis and Elton Parker "Sailing the Cyber Sea," *Joint Force Quarterly* 65 (Second Quarter 2012): 67, accessed November 20, 2014, <http://search.proquest.com/docview/1010737927>.

¹⁶⁹ Senate Armed Service Committee, “Report of the Commission to assess United States National Security Space Management and Organization,” by Donald Rumsfeld, et al., 107th Congr., 1st sess., March 28, 2001, 80.

¹⁷⁰ *Ibid*, 81.

¹⁷¹ *Ibid.*, 80.

Paralleling the need for the special personnel development, the budget to maintain and modernize the domain-centric equipment causes competition finite resources. Traditionally, the Air Force has funded around 80 times the burden of manning and equipping for space operations compared to the Army and Navy.¹⁷² A similar dilemma to General MacArthur's choice between ground and air motorization in 1931 affected General Charles Horner, Commander of US Air Force's Space Command in 1997. Horner assessed that the budget required to develop adequate space capabilities would drastically affect modernization of the total Air Force in other realms.¹⁷³ Competition for resources also affects, the division of knowledge, requiring a generalist approach to leadership.

A key force generation component is the indoctrination, training, and education of officers in space and cyber. In 2007, the US Air Force occupational specialties for ballistic missile officers and space satellite officers combined into a single specialty, despite the fact of little overlap in the technical and tactical knowledge requirements.¹⁷⁴ A 2006 RAND Corporation research survey showed that Air Force Space and Missile Officers, needed little special technical education and training for effective job performance (jobs of this nature are usually filled by civilians). By contrast, generating the senior Space and Missile Officers required for effectively leading the disparate missile defense and satellite space missions required a broad career path,

¹⁷² Jeffery R. Swegel, "A Fork in the Path to the Heavens: The Emergence of an Independent Space Force" (monograph, US Army Command and General Staff College, 2002), 4, accessed November 15, 2014, <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll3/id/419>.

¹⁷³ Alec Robinson, "Distinguishing Space Power from Air Power: Implications for the Space Force Debate" (research report, Air University, 1998), 3-4.

¹⁷⁴ Edward Tomme, "Expansion or Marginalization: How effects based organization could determine the future of Air Force Space Command" (research paper, Air Force Research Institute, Maxwell AFB, AL, 2008), 15.

which generated many experiences within the space domain.¹⁷⁵ As a relatively new domain, cyber development proponents advocate education, particularly combining tactical and technical courses into an undergraduate program for officers.¹⁷⁶ Specific education and experiences are important to building the personnel pool to sustain capabilities in domain-centric operations.

Space and cyber differ from air and sea, mainly in the risk to the force. While the potential effects of ICBMs and cyber-attacks drive a demand for specialized forces in the space and cyber domain, there is currently no risk to the force that requires a robust or resilient organization, which exists in the land, air, and sea domains. Therefore, mutual support to other domains and organizational adaptation are limited only by the constraints of resources. These cases can help to draw further conclusions about the implications for the human domain initiatives' ability to integrate, adapt, and focus military development in relation to an increased demand for capabilities in population-centric approaches to warfare.

Considerations for Integration in the Human Domain

The historical events in major organizational adaptations in sea, air, space, and cyber provide insights into potential obstacles in pursuing the human domain initiatives. Each case demonstrates greater growth toward autonomous institutions and in the case of sea and air adaptation, avoiding interdependencies. These trends in other domain conflict with the goal of the human domain to integrate and foster JIIM interdependencies. There are four areas in the air, sea, space, and cyber cases, which significantly affected the trend toward autonomy. First, the uneven risk between cross-domain operations influences integration. Second, the organizational adaption and new concepts developed each warfighting domain out-pace the evolution of interdependent

¹⁷⁵ Georges Vernez, et al., "Improving the Development and Utilization of Air Force Space and Missile Officers" (research report, RAND Corporation, 2006), 23-25.

¹⁷⁶ Robert M. Lee, "The Failing of Air Force Cyber," *Signal* 68, no. 3 (November 2013): 56-7, accessed November 21, 2015, <http://search.proquest.com/docview/1460879630>.

relationships. Third, the existence of multiple operating concepts within an institution competes against one another, which delays investment in capabilities. Fourth, investment outside the military realm is essential to creating and retaining the capacity for growth.

The way that institutional leaders viewed and defined risk influenced the ability to integrate. The US Army and US Navy each faced different threats in Santiago de Cuba. The Army's aversion to conducting an opposed landing degraded the ability to conduct mutually supporting and integrated operations. The US Marines at Guantanamo were more adequately trained and equipped, and therefore accepted the risk in opposed landings. In the development of concepts for air warfare, the early aviators faced risk from air-to-air combat while supporting ground troops with reconnaissance and observation. Similar to the US Army at Santiago, aviators looked to different ways and approaches to accomplish their mission through achieving mutually supporting effects, rather than integrated operations. In these instances, risk to the force was an obstacle to mutual support. However, in the space and cyber domains, where no significant risk to the force exists, maintaining interdependencies between institutions is only constrained by available resources and authorizations.

In the human domain, the "Strategic Landpower" whitepaper describes situations in which soldiers and leaders require "the ability to both build and destroy and the knowledge to know when to build and when to destroy."¹⁷⁷ Selecting the combinations of lethal and nonlethal operations to change behavior requires assessing the opportunity and risk associated with the required actions. If lethal and nonlethal, or building and destroying, share unequal risks, then the potential for mutually supporting effects may be affected by decisions based on risk to the force. Risk to the force and its associated organizational and individual conflict and stressors can also cause innovation and adaptation.

¹⁷⁷ Odierno, Amos, and McRaven, 5.

Institutions adapt and innovate at different rates, which can create gaps in synchronizing efforts and effects. The US Navy adapted its ability to command the sea beyond the capacity for the US Army and Merchant Marine to mobilize follow-on forces. In Manila, Admiral Dewey's successful defeat of the Spanish Squadron created a window of opportunity to exploit that success. However, the delay in exploiting the successful naval operations, due to the US Army's slower rate of mobilization and lack of available transport vessels, created greater instability. Similarly, in the World War II Italian Campaign, ground and air component leaders agreed on adapting by combining the effects of operations to provide mutual support during Operations Strangle and Diadem. Despite the success in achieving effects, synchronizing the effects between air and ground operations became a limiting factor in creating the desired conditions. A focus on independent maneuver and the CBO distracted from developing the organizational structure and doctrinal processes required to coordinate deep and close operations with mutually supporting effects.

Synchronizing the effects of lethal and non-lethal operations across multiple JIIM actors in the human domain requires the ability to react to successes. While the US military's investment and adaptation in population-centric warfare approach will build capability to operate in a human domain, the failure to adapt or react among other JIIM actors may result in successful operations, which have negative long-term strategic consequences. The military then faces a dilemma to fill the capability gaps or constrain adaption. Both of these options challenge the intended goals of the human domain concept.

Organizing for two domains, with different concepts of operation, within the same institution creates trade-offs in investment and innovation. The US Army and its Air Corps competed, rather than cooperated for investment in the 1930's. The same phenomenon occurred in the US Air Force's ability to invest in both air and space technology and capabilities. The US

military may not be required to invest large sums of money in adaptation in the human domain.¹⁷⁸

However, the less tangible requirements of time and effort available for organizational change and the continuing demands for military operations will influence the possibilities for innovation and learning about the human domain.

One area of concern for sea, air, space, and cyber innovators was the United States' capacity to provide technological and human capital appropriate to their domains. The US Navy saw engineering and shipbuilding as essential to their development in their new strategic direction. The aeronautical enterprise of the United States was also essential to maintaining the equipment, personnel, and innovation required for future wars. The large requirement for civilian scientists, engineers, and physicists in space also requires investment in education in those areas. The human domain concepts can also benefit from investment in the United States ability to create strategic depth in knowing, acting, and influencing in the human environment.

Conclusion

This monograph evaluated the human domain concept's ability to guide the US military's focus in adaptations required to develop increased capabilities related to population-centric approaches to future warfare. The author asserts that there is utility in the human domain concept, but with unintended consequences to the organization. To support this assertion, this paper used the definition of the human domain concept compared to the purpose and use of other warfighting domains. Warfighting domains provide a physical area to focus adaptation to develop the knowledge, influence, and activity for operating in an environment. The human domain and the use of population control as a stability mechanism provides a commonality to the purpose and definition of other warfighting domains. The cognitive link provides a connection for proponents to argue that adopting the human domain concept can assist in integrating JIIM capabilities, adapt

¹⁷⁸ Ibid, 7; Cleveland and Ferris, "Toward Strategic Landpower," 23.

the US Army's organizational design, and delineate the roles of SOF and conventional forces

Next, this paper evaluated the goals of the human domain through the lens of organization theory and business management research. In the current military organization, warfighting domains provide a division of labor or knowledge. Theoretically, a new domain or a change in the strategic direction of an existing domain generates the need for organizational adaptation. The adaptations associated with prioritizing development of population-centric warfare capabilities require new roles and specialized knowledge and activity, which also requires delineation of tasks between SOF and conventional forces. However, business research demonstrates the tendency, within the context of the US military's bureaucratic control system and dynamic external environment, for the expansion of capabilities relative to the human domain not to promote interdependencies. Therefore, the potential for the human domain to serve as a mechanism to integrate JIIM efforts is questionable. Evidence from population-centric conflicts, such as Somalia, Iraq, and Afghanistan demonstrates the business principles regarding organizational conflict, innovation, and expansion potentially have an impact on the US military's ability to accomplish the human domain concept's intended goals.

Finally, this paper used historical analysis from significant periods of expansion in warfighting domains: the US Navy from 1865-1898, US Army Air Forces from 1911-1947, and space and cyber formations from the 1960's until the present. The adaptation and innovation occurring in the periods and organization of focus for the historical analysis demonstrated the presence of the theoretical organizational tendencies to minimize dependence on other Services in cross-domain effects. Efforts to create resilient organizations did not eliminate interdependencies, but only contributed to an inability to generate mutual support and synchronize the synergistic effects of independent operations in time, space, and purpose. Uneven risks, differing adaptation rates, and competing investments between domains created a greater division of effort than integrating the divisions of labor. By using the concept of a human domain to generate

decentralized innovation, the US military is more likely to focus on developing independent solutions to capability gaps, rather than increasing the integration of interdependent efforts. However, by considering the risk to the force, adaptation rates, and investing in interdependencies, institutional leaders can mitigate negative effects. Ultimately, the concept of a human domain has a cognitive value in thinking about future adaptations in landpower, but not in determining solutions to capability gaps in landpower.

The best way to employ the human domain concept is as an analogy to other warfighting domains to increase the ability to think about future adaptation. Colin Gray, a noted commentator on contemporary military strategy, argues, “Strategic analogies should be nothing more than a cognitive crutch that allows us to ask the right questions.”¹⁷⁹ Using the ideas of domain-centric warfare, which are familiar to military personnel, can generate better ideas to inform development, but using ideas from the past in the future is not necessarily effective. However, using the developmental trends in sea, air, space, and cyber can help inform military effectiveness in population-centric approaches to warfare by generating better questions for future research.

The author recommends three areas for future research based on the analysis in this monograph. First, what DOTMLPF-P changes can affect the US military’s ability to develop and foster mutual support and synchronization amongst JIIM partners in population-centric warfare? The ability to integrate operations in time proved the greatest challenge in maintaining and exploiting strategic potential the initiative achieved through successful tactical operations. A second question is: what are the high-payoff investments in technology and human resources shared between traditional and human dimensions of warfare? Competing demands influence the ability to innovate and build capacity for future warfare. The Army Operating Concept’s focus on

¹⁷⁹John B. Sheldon and Colin S. Gray, “Theory Ascendant? Spacepower and the Challenge of Strategic Theory” in *Toward a Theory of Spacepower: Selected Essays*, ed. Charles D. Lutes and Peter L Hays (Washington DC: National Defense University Press, 2011), 12.

the continuities of war provides opportunity to invest in those capabilities that transcend multiple spectrums of potential future scenarios. Finally, Mahan and Mitchell identified the future of American seapower and airpower was dependent on the United States' investment in the civilian development of industry and economics in those realms. In what ways can the US military advocate investment and foster relationships in the United States' national capacity for understanding, operating in, and influencing the human environment?

Warfighting domains create a paradox. Organizationally, these domains serve as a division of labor and knowledge to increase military effectiveness and support the interdependencies in a bureaucratic structure. Operationally, warfighting domains provide influence and control with an independent value in military strategies. The goals of the human domain to integrate, adapt, and focus population-centric warfare create similar challenges to accomplish all three within a single concept. Using the idea of a human domain to influence decisions creates the potential for unintended consequences. The human domain requires an understanding the organizational impacts about the character and habits the US military must develop to expanded knowledge, influence, and activity in the human environment.

Bibliography

- Adjutant-General's Office of the United States. *Correspondence Relating to the War with Spain: Including the Insurrection in the Philippine Islands and the China Relief Expedition, April 15, 1898, to July 30, 1902*. Vol. 2. Washington, DC: Center of Military History, U.S. Army, 1993. Accessed March 21, 2015. <http://hdl.handle.net/2027/mdp.39015026958986>.
- Alden, Carroll S., and Allen Westcott. *The United States Navy: A History*. Chicago: J.B. Lippincott Company, 1943.
- Allen, Charles D., and Stephen J. Gerras. "Developing Creative and Critical Thinkers." *Military Review* 89, no. 6 (November 2009): 77-83. Accessed March 19, 2015. <http://search.proquest.com/docview/225311838>.
- Allen, Patrick D., and Dennis P. Gilbert. "Information Sphere Domain: Increasing Understanding and Cooperation." In *Virtual Battlefield: Perspectives on Cyber Warfare*. Edited by Christian Czosseck and Kenneth Geers, 132-42. Amsterdam: IOS Press, 2009.
- Anderson, Philip. "Complexity Theory and Organization Science." *Organization Science* 10, no. 3 (May 1999): 216-232. Accessed November 30, 2014. *Business Source Complete*, EBSCOhost.
- Andrews, Frank L. "A Stability Force: The Missing Link in Achieving Full-Spectrum Dominance." Monograph, US Army Command and General Staff College, 2004. Accessed February 24, 2015. <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll3/id/88>.
- Bar-Yam, Yaneer. *Making Things Work: Solving Complex Problems in a Complex World*. Cambridge, MA: NECSI Knowledge Press, 2004.
- Blechman, Barry, and Stephen Kaplan. *Force Without War: The US Military as a Political Instrument*. Washington DC: Brookings Institution Press, 1978.
- Brookes, Andrew. *Air War Over Italy*. Hersham, Surrey: Ian Allen Publishing, 2000.
- Campion, Michael A., Troy V. Mumford, Frederick P. Morgeson, and Jennifer D. Nahrgang. "Work Redesign: Eight Obstacles and Opportunities." *Human Resource Management* 44, no. 4 (Winter 2005): 367-90. Accessed March 25, 2015. <http://search.proquest.com/docview/621006283>.
- Celeski, Joseph D. "SOF, the Human Domain and the Conduct of Campaigns." *Special Warfare* 27, no. 3 (July 2014): 5-9. Accessed January 21, 2015. <http://search.proquest.com/docview/1561988159>.
- _____. "SOF-Power Workshop: A Way Forward for Special Operations Theory and Strategic Art." Conference report from Joint Special Operations University's SOF-Power Workshop, MacDill AFB, FL, August 22-23, 2011. Accessed July 21, 2014. [https://jsou.socom.mil/Documents/SOF-Power%20Workshop %20Final.pdf](https://jsou.socom.mil/Documents/SOF-Power%20Workshop%20Final.pdf).
- Clausewitz, Carl von. *On War*. Translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.
- Cleveland, Charles T., and Stuart L. Farris. "A Global Landpower Network could be the Ultimate Anti-Network." *Army* 64, no. 8 (August 2014): 55-7. Accessed November 13, 2014. <http://search.proquest.com/docview/1552835057>

- ____. "Knowledge is Power: Adaptations Required to Survive in the Human Domain." *Army* 64, no. 7 (July 2014): 40-2, accessed August 16, 2014. <http://search.proquest.com/docview/1543044132>.
- ____. "Special Operations-An Army Core Competency." *Army* 64, no. 6 (June 2014): 25-8. Accessed December 11, 2014, <http://search.proquest.com/docview/1540742008>.
- ____. "Toward Strategic Landpower." *Army* 63, no. 7 (July 2013): 20-3. Accessed November 13, 2014. <http://search.proquest.com/docview/1398811970>.
- Connable, Ben. "All our Eggs in a Broken Basket: How the Human Terrain System is Undermining Sustainable Military Cultural Competence." *Military Review* 89, no. 2 (March 2009): 57-64. Accessed December 5, 2014. <http://search.proquest.com/docview/225305986>.
- Connolly, Corvin J. "Marshal of the Royal Air Force Sir John Cotesworth Slessor and the Anglo-American Air Power Alliance, 1940-1945." PhD diss., University of Texas A&M, 2001.
- Corbett, Julian S. *Some Principles of Maritime Strategy*. London: 1911. Accessed June 11, 2014. <http://www.gutenberg.org/files/15076/15076-h/15076>.
- Cosmas, Graham A. "Army-Navy Joint Operations in the Spanish-American War." In *Theodore Roosevelt, the US Navy, and the Spanish-American War*. Edited by Edward J. Marolda, 31-38. New York: Palgrave, 2001.
- Department of Defense. *National Defense Strategy*. Washington DC: Government Printing Office, June 2008. Accessed March 20, 2015, <http://www.defense.gov/news/2008%20National%20Defense%20Strategy.pdf>
- ____. *Quadrennial Defense Report*. Washington DC: Government Printing Office, 2010. Accessed November 24, 2014. http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf
- Deptula, David A. "Toward Restructuring National Security." *Strategic Studies Quarterly* 1, no. 2 (Winter 2007): 5-17. Accessed December 5, 2014, <http://search.proquest.com/docview/1429243548>.
- Dolman, Everett C. *Astropolitik: Classical Geopolitics in the Space Age*. Portland, OR: Frank Cass, 2002.
- ____. *Pure Strategy: Power and Principle in the Space and Information Age*. New York: Routledge, 2005.
- Douhet, Giulio. *Command of the Air*. Translated by Dino Ferrari. In *Roots of Strategy Book 4*. Edited by David Jablonsky, 263-407. Mechanicsburg, PA: Stackpole Books, 1999.
- Douglass, Roy. "Pursuing the Human Domain Risks Reinvesting on the Basics" Strategic research project, US Army War College, 2013. Accessed July 15, 2014, <http://www.dtic.mil/cgi-bin/GetTRDoc%3FAD%3DADA589406>.
- Drew, Dennis. "The Essence of Aerospace Power." *Aerospace Power Journal* 15 no. 2 (Summer 2001): 23:31. Accessed November 27, 2014. <http://search.proquest.com/docview/217762561>.
- Feickert, Andrew. "Does the Army Need a Full-Spectrum Force or Specialized Units? Background and Issues for Congress." Report, Congressional Research Service, January 18, 2008. Accessed March 12, 2015. <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA476145>.

- Fernandez, Miguel A. "The Spanish Navy and the War." In *Theodore Roosevelt, the US Navy, and the Spanish-American War*. Edited by Edward J. Marolda, 20-28. New York: Palgrave, 2001.
- Finney, Robert T. "History of the Air Corps Tactical School, 1920-1940." US Air Force Historical Studies, Air University, 1955. Accessed March 25, 2015. <http://www.afhra.af.mil/shared/media/document/AFD-090602-019.pdf>.
- Floyd, Steven W., and Peter J. Lane. "Strategizing Throughout the Organization: Management Role Conflict in Strategic Renewal." *The Academy of Management Review* 25, no. 1 (January 2000): 154-77. Accessed March 16, 2015. <http://search.proquest.com/docview/210977665>.
- Gates, Robert M. Speech to the U.S. Global Leadership Campaign, Washington DC, July 15, 2008. Accessed March 20, 2015. <http://www.defense.gov/speeches/speech.aspx?speechid=1262>.
- Gash Jim. "Physical Operating Environments: How the Cyber-Electromagnetic Environment Fits." *Canadian Military Journal* 12, no. 3 (Summer 2012): 28-34. Accessed November 12, 2014. <http://www.journal.forces.gc.ca/vol12/no3/page28-eng.asp>.
- Gleaves, Albert. *Life and Letters of Stephen B. Luce, Rear Admiral USN*. New York: The Knickerbocker Press, 1925.
- Glines, Carroll V. "The Long Road to an Independent Air Force." *Aviation History* 18, no. 1 (September 2007): 30-33. Accessed November 25, <http://search.proquest.com/docview/219858420>.
- Gorenflo, Mark, and Mark R. Hagerott. "The Shifting Domain of War." *United States Naval Institute Proceedings* 132, no. 11 (November 2006): 38-43. Accessed November 3, 2014. <http://search.proquest.com/docview/205983646>.
- Hagan, Kenneth J. *American Gunboat Diplomacy and the Old Navy, 1877-1889*. Westport, CT: Greenwood Press, 1973.
- Hatch, Mary Jo, and Ann L. Cunliffe. *Organization Theory: Modern, Symbolic, and Postmodern Perspectives*. 2d ed. New York: Oxford University Press, 2006.
- Hattendorf, John B., B. Mitchell Simpson, and John R. Wadleigh. *Sailors and Scholars: The Centennial History of the US Naval War College*. New Port, RI: Naval War College Press, 1984.
- Hayden, Dale L. "Air-Mindedness." *Air & Space Power Journal* 22, no. 4 (Winter 2008): 44-45. Accessed March 12, 2015. <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj08/win08/hayden.html>.
- Herring, George C. *From Colony to Superpower: U.S. Foreign Relations since 1776*. New York: Oxford University Press, 2008.
- Hoffman, Frank, and Michael C. Davies. "Joint Force 2020 and the Human Domain: Time for a New Conceptual Framework?" *Small Wars Journal*, June 10, 2013. Accessed November 22, 2014. <http://www.smallwarsjournal.com/printpdf/14125>.
- Jervis, Robert. *System Effects: Complexity in Political and Social Life*. 3d ed. Princeton, NJ: Princeton University Press, 1999.
- Joint Chiefs of Staff. "Joint Operational Access Concept." Washington DC: Government Printing Office, 2012.

- ____. "Joint Vision 2020." Washington DC: Government Printing Office, June 2000. Accessed November 10, 2015, <http://www.dtic.mil/docs/citations/ADA377926>.
- Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*. Washington DC: Government Printing Office, amended January 31, 2011.
- Joint Publication 3-14, *Space Operations*. Washington DC: Government Printing Office, 2013.
- Joint Publication 3-33, *Joint Task Force Headquarters*. Washington DC: Government Printing Office, 2012.
- Joint Publication 5-0, *Joint Operations Planning Process*. Washington DC: Government Printing Office, 2011.
- Kelly, Joe. *Organizational Behavior: Its Data, First Principles, and Application*, 3d ed. Homewood, IL: Richard D. Irwin, Inc., 1980.
- Klein, John J. "Corbett in Orbit: A Maritime Model for Strategic Space Theory." *Naval War College Review* 57, no. 1 (Winter 2004): 58-74. Accessed November 20, 2014. <http://search.proquest.com/docview/205935672>.
- Kotter, John P. *Power and Influence: Beyond Formal Authority*. New York: The Free Press, 1985.
- Krepinevich, Andrew. "Cavalry to Computer: The Pattern of Military Revolutions." *The National Interest* 37 (Fall 1994): 30-43. Accessed November 15, 2014. <http://nationalinterest.org/article/cavalry-to-computer-the-pattern-of-military-revolutions-848>.
- Lee, Robert M. "The Failing of Air Force Cyber." *Signal* 68, no. 3 (November 2013): 56-7. Accessed November 21, 2015. <http://search.proquest.com/docview/1460879630>.
- Leeke, Jim. *Manila and Santiago: The New Steel Navy in the Spanish-American War*. Annapolis, MD: The Naval Institute Press, 2009.
- de Leeuw, Hendrik. *From Flying Horse to Man in the Moon: A History of Flight from its Earliest Beginnings to the Conquest of Space*. New York: St. Martin's Press, 1963.
- Libicki, Martin C. "Cyberspace Is Not a Warfighting Domain" *I/S: A Journal of Law and Policy* 8, no. 2 (2012): 321-36. Accessed November 23, 2014. <http://moritzlaw.osu.edu/students/groups/is/files/2012/02/4.Libicki.pdf>.
- Litz, Brett T., et. al. "Posttraumatic Stress Disorder Associated with Peacekeeping Duty in Somalia for U.S. Military Personnel." *The American Journal of Psychiatry* 154, no. 2 (February 1997): 178-84. Accessed March 19, 2015. <http://search.proquest.com/docview/220472511>.
- Long, John Davis. *The New American Navy*. New York: Outlook Co., 1903. Accessed March 21, 2015. <http://hdl.handle.net/2027/loc.ark:/13960/t6f192636>.
- Mahan, Alfred T. *The Influence of Sea Power Upon History 1660-1783*. 12th ed. Boston: Little, Brown & Company, 1918. Accessed June 10, 2014, <http://www.gutenberg.org/files/13529/13529-h/13529>.
- Marburger, John H. "Science, Technology, and Innovation in a 21st Century Context." *Policy Sciences* 44, no. 3 (September 2011): 209-13. Accessed December 5, 2014, <http://search.proquest.com/docview/899186083>.

- March, James. *A Primer on Decision Making*. New York: Free Press, 2009.
- Martin, Grant M. "The Sublime: The Paradox of the 7th Warfighting Function." *Small Wars Journal*, November 25, 2013. Accessed November 30, 2014, <http://smallwarsjournal.com/jrnl/art/the-sublime-the-paradox-of-the-7th-warfighting-function>.
- Mattis, James. "House Armed Service Committee Testimony, 18 March 2009" *Small Wars Journal*, March 24, 2009. Accessed November 22, 2014, <http://smallwarsjournal.com/blog/general-james-mattis-before-the-hasc-18-march-2009>.
- McBride, William M. *Technological Change and the United States Navy 1865-1945*. Baltimore: Johns Hopkins University Press, 2000.
- Mitchell, William. *Winged Defense: The Development and Possibilities of Modern Air Power--Economic and Military*. In *Roots of Strategy Book 4*. Edited by David Jablonsky, 408-515. Mechanicsburg, PA: Stackpole Books, 1999.
- Morrow, Dwight W., et al. *Aircraft: Hearings before the President's Aircraft Board*. Vol. 2. Washington DC: Government Printing Office, 1925. Accessed March 15, 2015, <http://hdl.handle.net/2027/mdp.39015007665410>.
- Moschovitis, Christos, Hilary Poole, Tami Schuyler, and Theresa Senft. *History of the Internet: A Chronology 1843 to the Present*. Santa Barbara, CA: ABC-CLIO, 1999.
- Murray, Williamson, and MacGregor Knox. "Thinking About Revolutions in Warfare." In *The Dynamics of Military Revolution, 1300-2050*. Edited by Williamson Murray and MacGregor Knox, 1-14. New York: Cambridge University Press, 2001.
- Nalty, Bernard C. "The Defeat of Italy and Germany." In *Winged Shield, Winged Sword: A History of the United States Air Force*. Vol. 1. Edited by Bernard C. Nalty, 269-326. Washington DC: Air Force History and Museums Program, 1997.
- National Security Council Report 5520, May 20, 1955. Accessed December 18, 2014. <http://nsarchive.chadwyck.com>.
- Obama, Barack. "National Security Strategy." Washington DC: Government Printing Office, May 2010. Accessed July 12, 2014. <http://nssarchive.us/NSSR/2010.pdf>.
- Odierno, Raymond T., James F. Amos, and William H. McRaven, "Strategic Landpower: Winning the Clash of Wills." Washington DC, May 2013. Accessed June 21, 2014. <http://www.tradoc.army.mil/FrontPageContent/Docs/Strategic%20Landpower%20White%20Paper.pdf>.
- Osinga, Frans, and James Russell. "Conclusion: Military Adaptation and the War in Afghanistan." In *Military Adaptation in Afghanistan*. Edited by Theo Farrell, Frans Osinga, and James Russell, 288-326. Palo Alto, CA, USA: Stanford University Press, 2013. Accessed March 20, 2015. ProQuest ebrary.
- Osgood, Carl. "Behaviorism Invades the US Military." *Executive Intelligence Review*. July 20, 2012. Accessed March 15, 2015. http://www.larouchepub.com/eiw/public/2012/eirv39n28-20120720/34-36_3928.pdf
- Outlaw, Frank. "What They're Saying." *San Antonio Light*. May 18, 1977, 7-B. Cited in *Quote Investigator*. Accessed March 11, 2015. <http://quoteinvestigator.com/2013/01/10/watch-your-thoughts/>.

- Porch, Douglas. *The Path to Victory: The Mediterranean Theater in World War II*. New York: Farrar, Straus, and Giroux, 2004.
- Rice, Rondall. *The Politics of Air Power*. Lincoln, NE: University of Nebraska Press, 2004.
- Robinson, Alec. "Distinguishing Space Power from Air Power: Implications for the Space Force Debate." Research report, Air University, 1998.
- Robson, William A. *Aircraft in War and Peace*. London: MacMillan, 1916.
- Russell, James A. *Innovation, Transformation, and War: Counterinsurgency Operations in Anbar and Ninewa Provinces, Iraq, 2005-2007*. Palo Alto, CA: Stanford University Press, 2010. Accessed March 19, 2015. ProQuest ebrary.
- Sacolick, Bennet S., and Wayne W. Grigsby, Jr. "Special Operations/Conventional Forces Interdependence: A Critical Role in 'Prevent, Shape, Win'." *Army* 62, no. 6 (June 2012): 39-40. Accessed December 3, 2014. <http://search.proquest.com/docview/1022319740>.
- Schroeder, Ted. "The Misunderstood Basics." *Military Review* LIX, no. 1 (January 1979), 11-16. Accessed December 1, 2014. <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p124201coll1/id/357>.
- Scott, William C., and Terence R. Mitchell. *Organization Theory: A Structural and Behavioral Analysis*. 3d ed. Homewood, IL: Richard D. Irwin, Inc., 1976.
- Senge, Peter. *The Fifth Discipline: The Art & Practice of the Learning Organization*, 2d ed. New York: Doubleday, 2006.
- Sheldon, John B., and Colin S. Gray. "Theory Ascendant? Spacepower and the Challenge of Strategic Theory." In *Toward a Theory of Spacepower: Selected Essays*. Edited by Charles D. Lutes and Peter L. Hays, 1-17. Washington D.C.: National Defense University Press, 2011.
- Sherman, William C. *Air Warfare*. Reprint. Maxwell AFB, AL: Air University, 2002. Accessed November 11, 2014. <http://www.au.af.mil/au/awc/awcgate/au/sherman.pdf>.
- Shiner, John F. "The Heyday of the GHQ Air Force, 1935-1939." In *Winged Shield, Winged Sword: A History of the United States Air Force*, Vol. 1. Edited by Bernard C. Nalty, 135-162. Washington DC: Air Force History and Museums Program, 1997.
- Simpson, Bob. "Unified Field Theory: The End of Domain Centered Theories of Warfare," *On Theory*. Blog. Accessed January 5, 2015. <https://medium.com/on-theory/the-end-of-domain-centered-theories-of-warfare-d3ec7347bf28>.
- Slessor, John C. *Air Power and Armies*. Reprint. Tuscaloosa, AL, USA: University of Alabama Press, 2009. Accessed November 22, 2015. ProQuest ebrary.
- Soeters, Joseph, Paul van Fenema, and Robert Beeres. "Introducing Military Organizations." In *Managing Military Organizations: Theory and Practice*. Edited by Joseph Soeters, Paul van Fenema, and Robert Beeres, 1-14. New York: Routledge, 2010.
- Smith, Holland M. *The Development of Amphibious Tactics in the US Navy*. Washington, DC: History and Museums Division, Headquarters, U.S. Marine Corps, 1992. Accessed March 21, 2015. <http://hdl.handle.net/2027/mdp.39015028462284>.
- Smith, Rupert. *The Utility of Force: The Art of War in the Modern World*. New York: Vintage Books, 2008.

- Stares, Paul B. *The Militarization of Space: US Policy 1945-1984*. Ithaca, NY: Cornell University Press, 1985.
- Stavridis, James G., and Elton Parker. "Sailing the Cyber Sea." *Joint Force Quarterly* 65 (Second Quarter 2012): 61-7. Accessed November 20, 2014. <http://search.proquest.com/docview/1010737927>.
- Strategic Landpower Task Force. "Future Joint Concepts Focus on Human Elements." *WWW.ARM.Y.MIL: The Official Homepage of the United States Army*. Accessed January 25, 2015. http://www.army.mil/article/141535/Future_joint_concepts_focus_on_human_elements.
- Sumida, Jon T. *Inventing Grand Strategy and Teaching Command: The Classic Works of Alfred Thayer Mahan Reconsidered*. Washington, D.C.: Woodrow Wilson Center Press, 1997.
- Swegel, Jeffery R. "A Fork in the Path to the Heavens: The Emergence of an Independent Space Force." Monograph, US Army Command and General Staff College, 2002. Accessed November 15, 2014. <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll3/id/419>.
- Tanguy, Lucie. "Academic Studies and Technical Education: New Dimensions of an Old Struggle in the Division of Knowledge." *Sociology of Education* 58, no. 1 (January 1985): 20-33. Accessed March 20, 2015. <http://www.jstor.org/stable/2112538>.
- Tilghman, Andrew. "The Army's Other Crisis." *The Washington Monthly* 39, no. 12 (December 2007): 44-53. Accessed March 25, 2015. <http://search.proquest.com/docview/213691894>.
- Tomme, Edward. "Expansion or Marginalization: How effects based organization could determine the future of Air Force Space Command." Research paper 2008-1, Air Force Research Institute, 2008.
- Training and Doctrine Command Pamphlet 525-3-1, "The Army Operating Concept: Win in a Complex World." Washington D.C.: Government Printing Office, 2014.
- Training and Doctrine Command Pamphlet 525-3-7, "The US Army Human Dimension Concept." Washington D.C.: Government Printing Office, 2014.
- Training and Doctrine Command Pamphlet 525-8-5,s "US Army Functional Concept for Engagement." Washington DC: Government Printing Office, 2014.
- United Kingdom. Ministry of Defence. Joint Doctrine Publication 4 *Understanding*. Shrivenham, UK: Development, Concepts, and Doctrine Centre, December 2010.
- US Army Special Operations Command. "ARSOF 2022." *Special Warfare* 27, no. 2 (April - June 2013): 1A-32A. Accessed August 14, 2014. www.soc.mil/Assorted%20Pages/ARSOF2022_vFINAL.pdf.
- US Congress. Senate. Committee for Armed Services. *Report of the Commission to assess United States National Security Space Management and Organization*. By Donald Rumsfeld, et al. 107th Congr., 1st sess., March 28, 2001.
- US Congress. Senate. Committee for Armed Services. *Department of Defense Authorization Appropriations for Fiscal Year 1986: Hearing before the Committee on Armed Services*. 99th Congr., 1st sess., on S. Doc. 99-674, pt. 2, 5-7 Feb 1985. Accessed December 9, 2014, <http://babel.hathitrust.org>.

- US Congress. Senate. Select Committee on Intelligence. *Statement for the Record: Worldwide Threat Assessment of the US Intelligence Community to the Senate Select Committee on Intelligence*, by James R Clapper, 113th Cong., 1st sess., S. Hrg. 113-89. Washington DC, March 12, 2013. Accessed March 10, 2015, <http://www.intelligence.senate.gov/130312/clapper.pdf>.
- US Military Academy. "Santiago de Cuba, 25 April – 10 December, 1898." *Spanish-American War Atlas*. Accessed March 30, 2015. <http://www.usma.edu/history/SiteAssets/SitePages/Spanish%20American%20War/SAWOverviewSantiago.gif>
- US Military Academy. "Anzio – Cassino Area, 1944." *World War II European Theater Atlas*. Accessed March 30, 2015. <http://www.usma.edu/history/SiteAssets/SitePages/World%20War%20II%20Europe/WWIIEurope50.gif>
- US Space Command. "Long Range Plan: Implementing USSPACECOM Vision for 2020." Peterson AFB, CO: US Space Command, March 1998. Accessed December 1, 2014, <http://babel.hathitrust.org>.
- US Special Operations Command. "SOCOM 2020: Forging the Tip of the Spear." MacDill AFB, FL: Public Affairs Office, 2014. Accessed December 5, 2014. <http://www.defenseinnovationmarketplace.mil/resources/SOCOM2020Strategy.pdf>.
- Vego, Milan. *Operational Warfare at Sea: Theory and Practice*. New York: Routledge, 2009.
- Vernez, Georges, et al. "Improving the Development and Utilization of Air Force Space and Missile Officers." Research report, RAND Corporation, 2006. Accessed December 5, 2015. http://www.rand.org/content/dam/rand/pubs/monographs/2006/RAND_MG382.pdf.
- Wachter, Chris. "Air-Mindedness: The Core of Successful Air Enterprise Development." *Air & Spacepower Journal* 26, no. 1 (Jan-Feb, 2012): 50-57. Accessed March 5, 2015. <http://dtic.mil/cgi-bin/GetTRDoc?AD=ADA555475>.
- Watson, George M. "Building Air Power." In *Winged Shield, Winged Sword: A History of the United States Air Force*, Vol. 1. Edited by Bernard C. Nalty, 231-268. Washington DC: Air Force History and Museums Program, 1997.